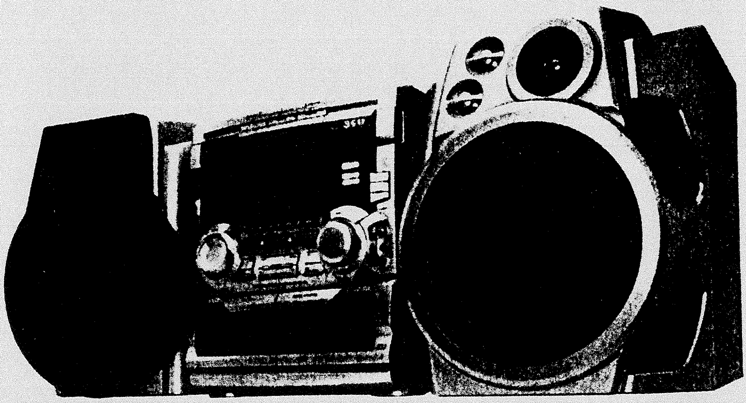
Mini System

FW830C/22/34
FW840C/22

Service
Service
Service



Service Manual

ReWritable CD COMPATIBLE — COMPACT disc DIGITAL AUDIO

Introduction of FW830C/22/34 and FW840C/22
For Service documentation please refer to Service Manual FW830C/21/37 - 3139 115 50090.

FW830C/22 refers to FW830C/21 with the following adaptations:

1. Mechanical & Accessories

Change:	139	4822 450 10704	Window Display
	143	4822 410 12545	Button Set R/N/D
	159	4822 443 11283	Cover Cassette Left
	387	4822 736 17007	Instruction For Use
	1107	4822 146 11145	Mains Transformer

2. Front Board

Add:	1409	4822 276 13775	Tact Switch
	1410	4822 276 13775	Tact Switch
	1411	4822 276 13775	Tact Switch
	2100	5322 122 32531	100pF 5% 50V
	2101	4822 126 13695	82pF 1% 63V
	2102	4822 126 13692	47pF 1% 63V
	2107	4822 126 13196	100nF 10% 25V
	2108	4822 126 13692	47pF 1% 63V
	2109	5322 116 80853	560pF 5% 63V
Add:	2110	5322 116 80853	560pF 5% 63V
	2111	4822 124 41576	2,2μF 20% 50V
	3107	4822 051 10102	1k 2% 0,25W
	3112	4822 117 11449	2k2 1% 0,1W
	3113	4822 117 13579	220k 1% 0,1W
	3114	4822 051 10102	1k 2% 0,25W
	3115	4822 051 10102	1k 2% 0,25W
	3710	4822 117 11503	220R 1% 0,1W
	5100	4822 157 62552	Coil 2,2μH 5%
	5402	4822 242 72195	QUARZ 4,332MHz
	6406	4822 130 10792	LTL-1CHPE
	7422	4822 209 31981	SAA6579T
Change:	3660	4822 117 11383	12k 1% 0,1W
Delete:	1408 , 3116 , 3117		

3. Power5VA Module - Mains Board

Add:	1905	4822 071 55002	Fuse T5A 250V
	5901	4822 157 11832	400μH 3A

(P.T.O.)

CLASS 1
LASER PRODUCT

© Copyright 1999 Philips Consumer Electronics B.V. Eindhoven, The Netherlands
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.

GB 3139 115 50110

Published by BB 9921 Service Audio   Printed in The Netherlands   Subject to modification

PCS 102 751

PHILIPS

Add:	6900	4822 130 31878	1N4003G
Change:	3904	4822 116 52244	15k 5% 0,5W
	5903	4822 146 11143	Standby Transformer
Delete:	1902 , 1903 , 1906 , 1907 , 1909 , 2904 , 2905 , 3905 , 3906 , 3920 , 5902 , 6908 , 6909 , 6910 , 7901 , 7902		

4. Tuner Board : Refer to TUNER 95 (RDS) version.

5. Tape Module : Refer to attach pages (9-1 to 9-14)
ETF5-FE DB/DD/FR Module.

FW830C/34 refers to FW830C/21 with the following adaptations:

1. Mechanical & Accessories

Change:	139	4822 450 10704	Window Display
	143	4822 410 12545	Button Set R/N/D
	159	4822 443 11283	Cover Cassette Left
	387	4822 736 17104	Instruction For Use
	1107	4822 146 11145	Mains Transformer

2. Front Board

Add:	1409	4822 276 13775	Tact Switch
	1410	4822 276 13775	Tact Switch
	1411	4822 276 13775	Tact Switch
	2100	5322 122 32531	100pF 5% 50V
	2101	4822 126 13695	82pF 1% 63V
	2102	4822 126 13692	47pF 1% 63V
	2107	4822 126 13196	100nF 10% 25V
	2108	4822 126 13692	47pF 1% 63V
	2109	5322 116 80853	560pF 5% 63V
	2110	5322 116 80853	560pF 5% 63V
	2111	4822 124 41576	2,2µF 20% 50V
	3107	4822 051 10102	1k 2% 0,25W
	3112	4822 117 11449	2k2 1% 0,1W
	3113	4822 117 13579	220k 1% 0,1W
	3114	4822 051 10102	1k 2% 0,25W
	3115	4822 051 10102	1k 2% 0,25W
	3710	4822 117 11503	220R 1% 0,1W
	5100	4822 157 62552	Coil 2,2µH 5%
	5402	4822 242 72195	QUARZ 4,332MHz
	6406	4822 130 10792	LTL-1CHPE
	7422	4822 209 31981	SAA6579T
Change:	3660	4822 117 11383	12k 1% 0,1W
Delete:	1408 , 3116 , 3117		

3. Power5VA Module - Mains Board

Add:	1905	4822 071 55002	Fuse T5A 250V
	5901	4822 157 11832	400µH 3A
	6900	4822 130 31878	1N4003G
Change:	3904	4822 116 52244	15k 5% 0,5W
	5903	4822 146 11143	Standby Transformer
Delete:	1902 , 1903 , 1906 , 1907 , 1909 , 2904 , 2905 , 3905 , 3906 , 3920 , 5902 , 6908 , 6909 , 6910 , 7901 , 7902		

4. Tuner Board : Refer to ECO5 SYS /14RDS version
2-Band. FM/MW (RDS).

5. Tape Module : Refer to attach pages (9-1 to 9-14)
ETF5-FE DB/DD/FR Module.

FW840C/22 refers to FW830C/21 with the following adaptations:

1. Mechanical & Accessories

Change:	139	3139 117 89320	Window Display
	143	3139 117 88930	Button Set R/N/D
	159	3139 117 88940	Cover Cassette Left
	350	3139 118 77200	L/R Loudspeaker Box
	387	3139 116 19260	Instruction For Use
	1107	3103 308 30280	Mains Transformer

2. Front Board

Add:	1409	4822 276 13775	Tact Switch
	1410	4822 276 13775	Tact Switch
	1411	4822 276 13775	Tact Switch
	2100	5322 122 32531	100pF 5% 50V
	2101	4822 126 13695	82pF 1% 63V
	2102	4822 126 13692	47pF 1% 63V
	2107	4822 126 13196	100nF 10% 25V
	2108	4822 126 13692	47pF 1% 63V
	2109	5322 116 80853	560pF 5% 63V
	2110	5322 116 80853	560pF 5% 63V
	2111	4822 124 41576	2,2µF 20% 50V
	3107	4822 051 10102	1k 2% 0,25W
	3112	4822 117 11449	2k2 1% 0,1W
	3113	4822 117 13579	220k 1% 0,1W
	3114	4822 051 10102	1k 2% 0,25W
	3115	4822 051 10102	1k 2% 0,25W
	3710	4822 117 11503	220R 1% 0,1W
	5100	4822 157 62552	Coil 2,2µH 5%
	5402	4822 242 72195	QUARZ 4,332MHz
	6406	4822 130 10792	LTL-1CHPE
	7422	4822 209 31981	SAA6579T
Change:	3660	4822 117 11383	12k 1% 0,1W
Delete:	1408 , 3116 , 3117		

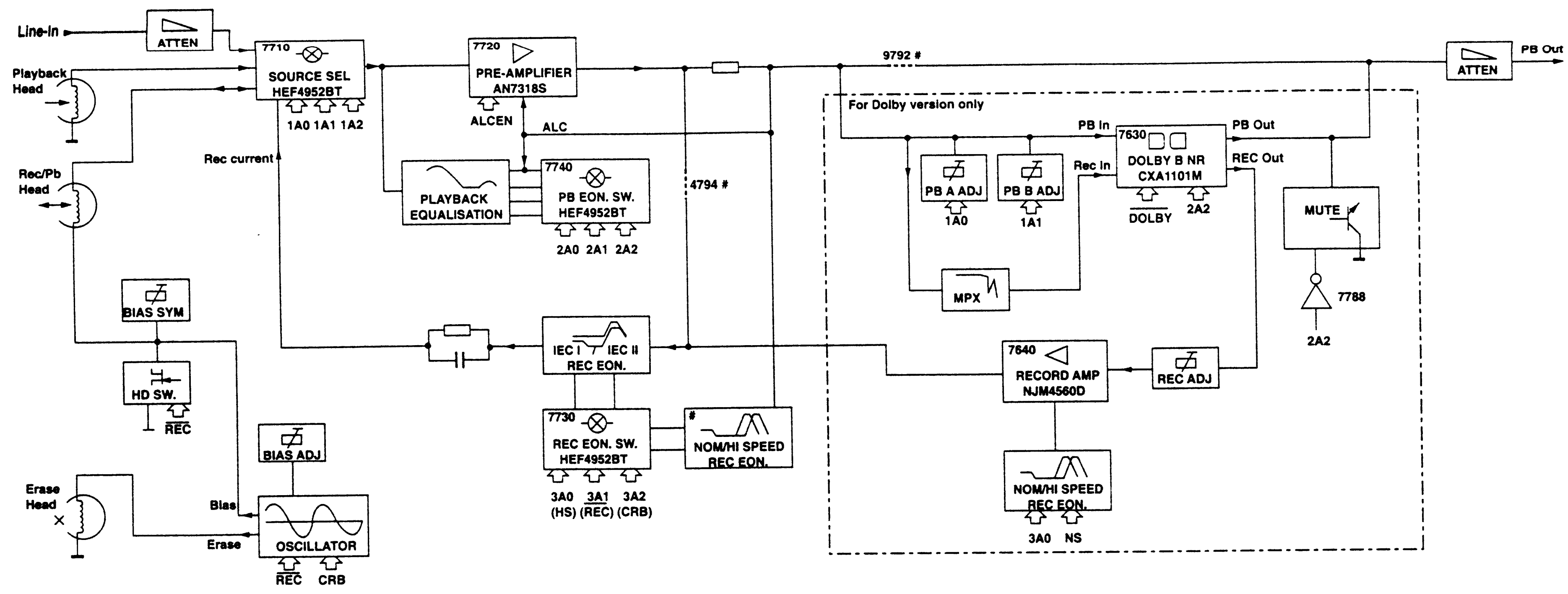
3. Power5VA Module - Mains Board

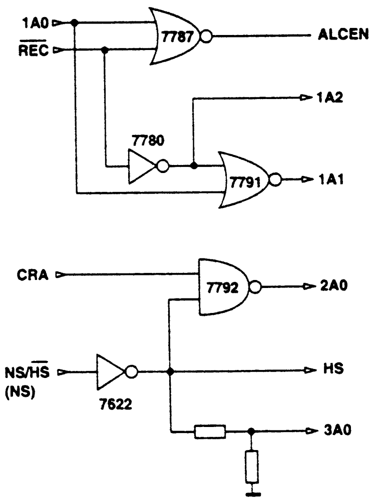
Add:	1905	4822 071 55002	Fuse T5A 250V
	5901	4822 157 11832	400µH 3A
	6900	4822 130 31878	1N4003G
Change:	3904	4822 116 52244	15k 5% 0,5W
	5903	4822 146 11143	Standby Transformer
Delete:	1902 , 1903 , 1906 , 1907 , 1909 , 2904 , 2905 , 3905 , 3906 , 3920 , 5902 , 6908 , 6909 , 6910 , 7901 , 7902		

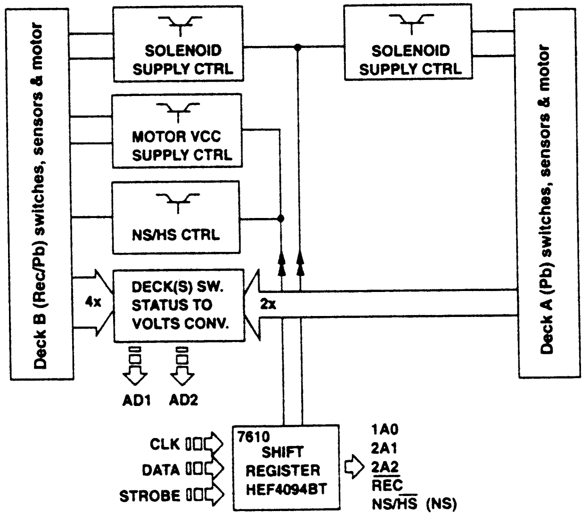
4. Tuner Board : Refer to TUNER 95 (RDS) version.

5. Tape Module : Refer to attach pages (9-1 to 9-14)
ETF5-FE DB/DD/FR Module.

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710 SOURCE SEL HEF4952BT
1A0 1A1 1A2
Rec current
7720 PRE-AMPLIFIER AN7318S
ALCEN
ALC
PLAYBACK EQUALISATION
7740 PB EON. SW. HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630 DOLBY B NR CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
PB B ADJ
1A0
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I IEC II REC EON.
7730 REC EON. SW. HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
# NOM/HI SPEED REC EON.
7640 RECORD AMP NJM4560D
REC ADJ
NOM/HI SPEED REC EON.
3A0 NS
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
DECK(S) SW. STATUS TO VOLTS CONV.
4x
2x
AD1 AD2
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
CLK
DATA
STROBE
7610 SHIFT REGISTER HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701. For Dolby sets the signal from IC7740 will pass through IC7630 (CXA1551M) for dolby noise processing before going to the connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B. For Dolby sets the amplified wil pass through IC7630 (CXA1551M) for dolby noise processing, amplified to the right level by IC7640 (NJM4560M) before record equalization.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

14. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

15. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

16. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

17. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

18. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

19. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 INTERCONNECTION TO AF BOARD

O	1	REC-L	Record input left
O	2	REC-R	Record input right
O	3	GND A	AF Ground
O	4	TAPE-L	Playback output left
O	5	+12V	D.C. supply (+12V) in
O	6	TAPE-R	Playback output right
O	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 INTERCONNECTION TO AF BOARD

O	1	GND M	Motor Ground
O	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 INTERCONNECTION TO FRONT BOARD

O	1	AD2	Deck sensing switches output voltage / Deck A EOT
O	2	AD1	Deck sensing switches output voltage / Deck B EOT
O	3	+5	DC supply +5V for ADC network
O	4	GND P	Control & Oscillator Ground
O	5	CLK	HEF4094BT shift register Clock line
O	6	DATA	HEF4094BT shift register Data line
O	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 DECK B HEADS CONNECTON *(For ETF6... only)*

O	1	B R/P HD L+	R/P Head left channel positive
O	2	GND A	R/P Head return ground
O	3	B R/P HD R+	R/P Head right channel positive
O	4	ERASE HEAD	Erase Head
O	5	GND A	Erase Head ground

CONNECTOR 1720 DECK B HEADS CONNECTON *(For ETF5... only)*

O	1	B R/P HD L+	R/P Head left channel positive
O	2	B R/P HD L-	R/P Head left channel negative
O	3	B R/P HD R+	R/P Head right channel positive
O	4	B R/P HD R-	R/P Head right channel negative
O	5	ERASE HEAD	Erase Head
O	6	GND A	Erase Head ground

CONNECTOR 1730 DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

O	1	A PB HD L+	Pb Head left channel positive
O	2	GND A	Pb Head return ground shield
O	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740 DECK B CONTROL INTERFACE *(For ETF5... Double Deck only)*

O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply	
O	6	Vcc	Deck / Motor supply	
O	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	
O	9	H	H pin for motor	
O	10	L	L pin for motor	

CONNECTOR 1750 DECK A CONTROL INTERFAC *(For ETF5... Double Deck only)*

O	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	2	PHOTO A	Photo sensor output (tape movement indication)	
O	3	SOL A	Solenoid supply	
O	4	Vcc	Deck/Motor supply	
O	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	6	GND M	Deck/Motor ground	

CONNECTOR 1760 DECK B CONTROL INTERFACE *(For Single Deck only)*

O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply	
O	6	Vcc	Deck / Motor supply	
O	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	

CONNECTOR 1770 DECK A & B CONTROL INTERFACE *(For ETF6... only)*

O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply for deck B	
O	6	Vcc	Deck / Motor supply	
O	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	
O	9	L	L pin for motor	
O	10	H	H pin for motor	
O	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
O	12	SOL A	Solenoid supply for deck A	
O	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM A ELECTRONICS

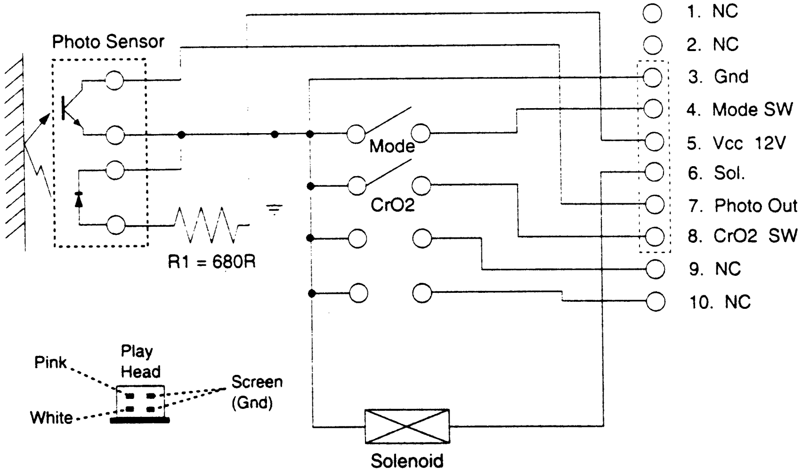
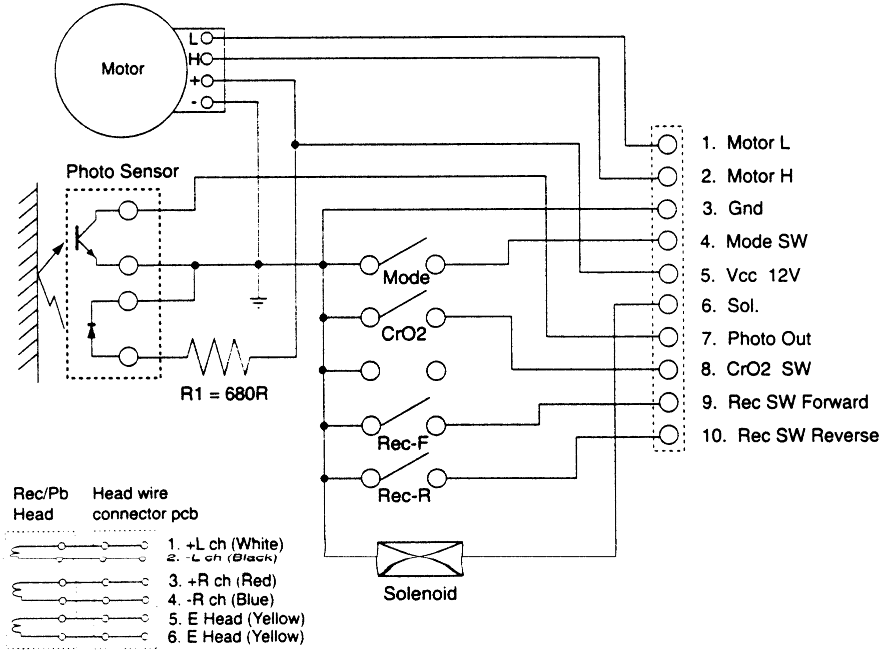


Photo Sensor
R1 = 680R
Mode
CrO2
1. NC
2. NC
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. NC
Pink
White
Play Head
Screen (Gnd)
Solenoid

TAPE MECHANISM B ELECTRONICS


Motor
L
H
+
-
Photo Sensor
R1 = 680R
Mode
CrO2
Rec-F
Rec-R
Solenoid
1. Motor L
2. Motor H
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. Rec SW Forward
10. Rec SW Reverse
Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. -L ch (Black)
3. +R ch (Red)
4. -R ch (Blue)
5. E Head (Yellow)
6. E Head (Yellow)

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	1 or 2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	7 or 8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	1 or 2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only

# For Auto-reverse version only

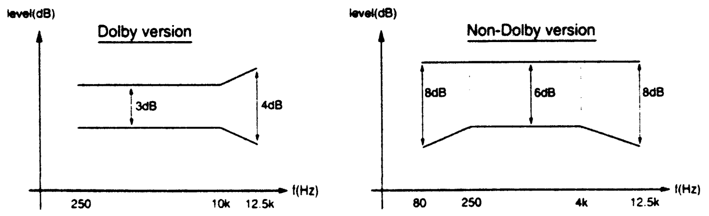
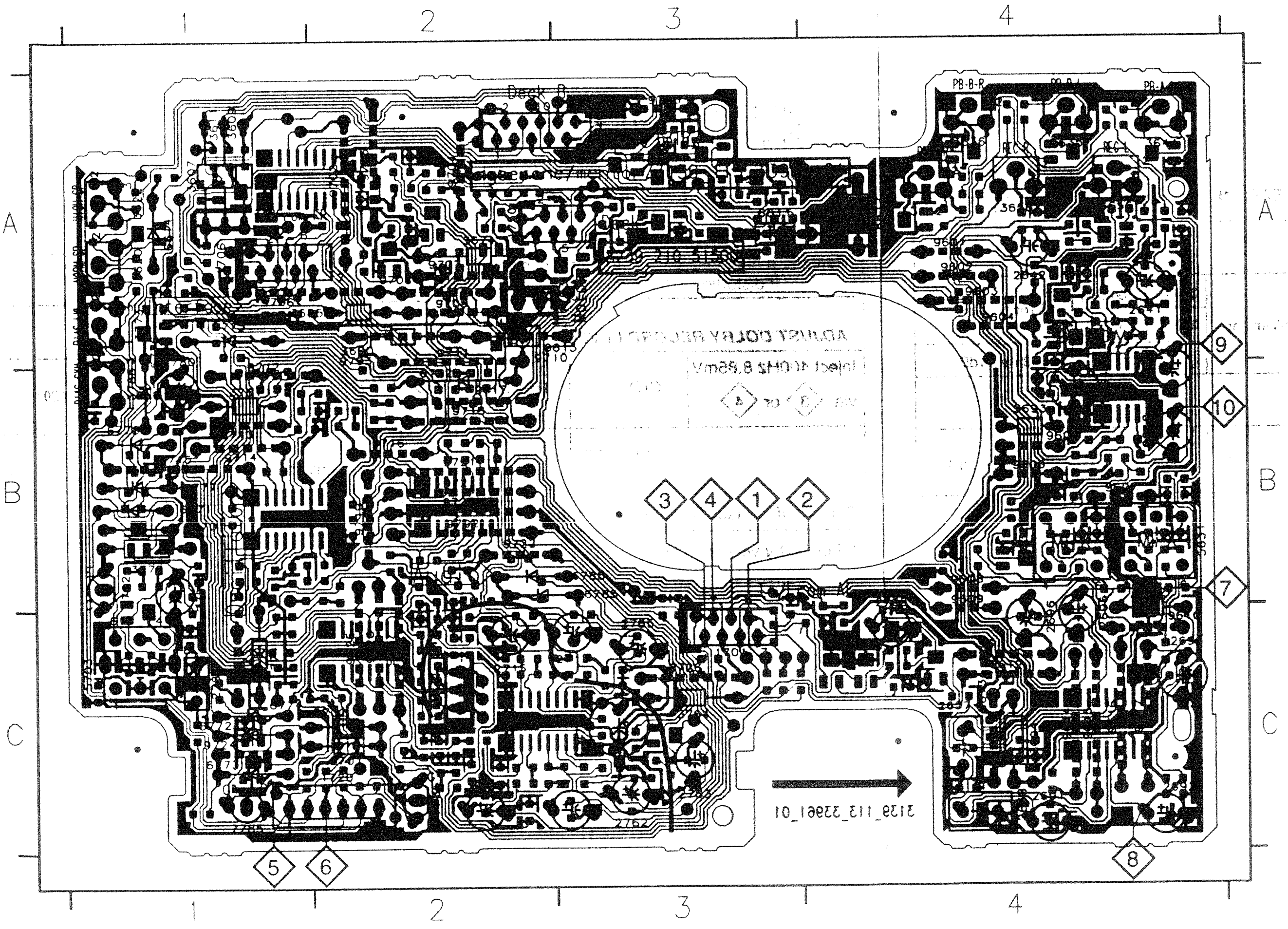


figure. 1

COMPONENT LAYOUT

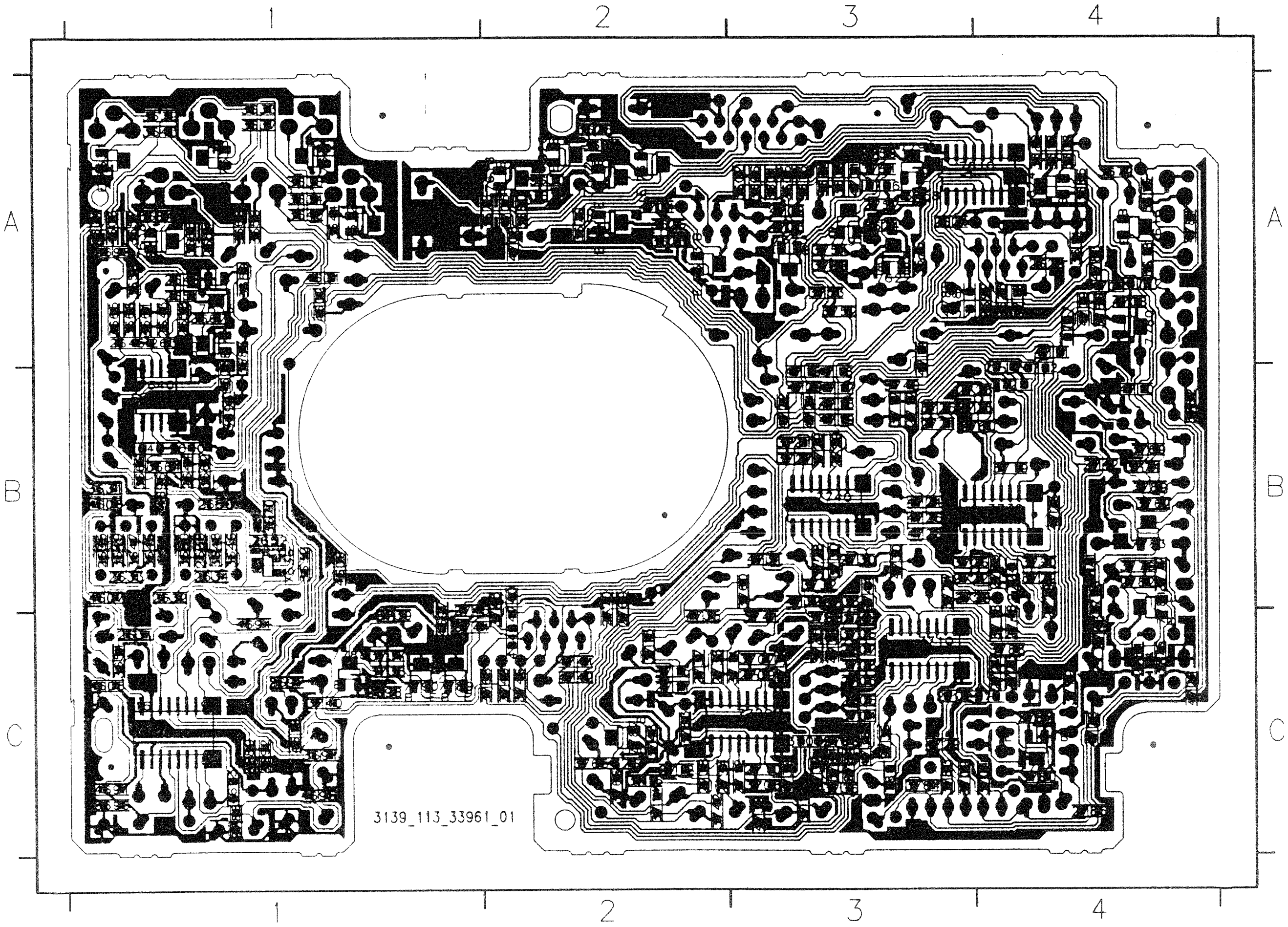
1701	C3
1703	A3
1706	A1
1720	C2
1730	C2
1740	A3
1750	A2
2637	C4
2638	C4
2641	A4
2642	A4
2647	B4
2648	B4
2691	C4
2692	C4
2693	C4
2694	B4
2695	C4
2696	C4
2713	C3
2714	C3
2715	C2
2716	C2
2741	C1
2761	C3
2762	C3
2763	C3
2765	C3
2768	B4
2780	A1
2784	C1
2785	B1
3607	A1
3609	A1
3611	A1
3620	A1
3622	A1
3635	A4
3636	A4
3641	A4
3642	A4
3652	B4
3655	A4
3656	A4
3674	A2
3685	A1
3690	A2
3693	B4
3694	C4
3761	B1
3764	C3
3773	A1
3778	B1
3785	B1
5631	B4
5632	B4
5701	C2
5702	C2
5703	C1
6611	A3
6612	A4
6613	A3
6614	A1
6770	B1
6771	B1
6772	C1
6773	C1
6774	C1
6775	A1
6776	A1
6777	B1
6778	B1
6782	B2
6785	B3
6786	B3
7782	B1
7785	C1
7786	C2
9601	A4
9602	A4
9603	A4
9604	A4
9605	B4
9606	B4
9607	B4
9608	B4
9609	B4
9610	C4
9611	C4
9612	C4
9613	C4
9614	C4
9615	C4
9616	C4
9617	C4
9702	A2
9703	A2
9704	A2
9705	A3
9706	A1
9707	A2
9708	A2
9709	A2
9710	A2
9711	A2
9712	A1
9713	B1
9714	B1
9715	B1
9716	B2
9717	B2
9718	B2
9719	B2
9720	B2
9721	B2
9722	B2
9723	C1
9724	C1
9725	C2
9726	C2
9727	C2
9728	C3
9791	B2
9792	B2
9793	A2



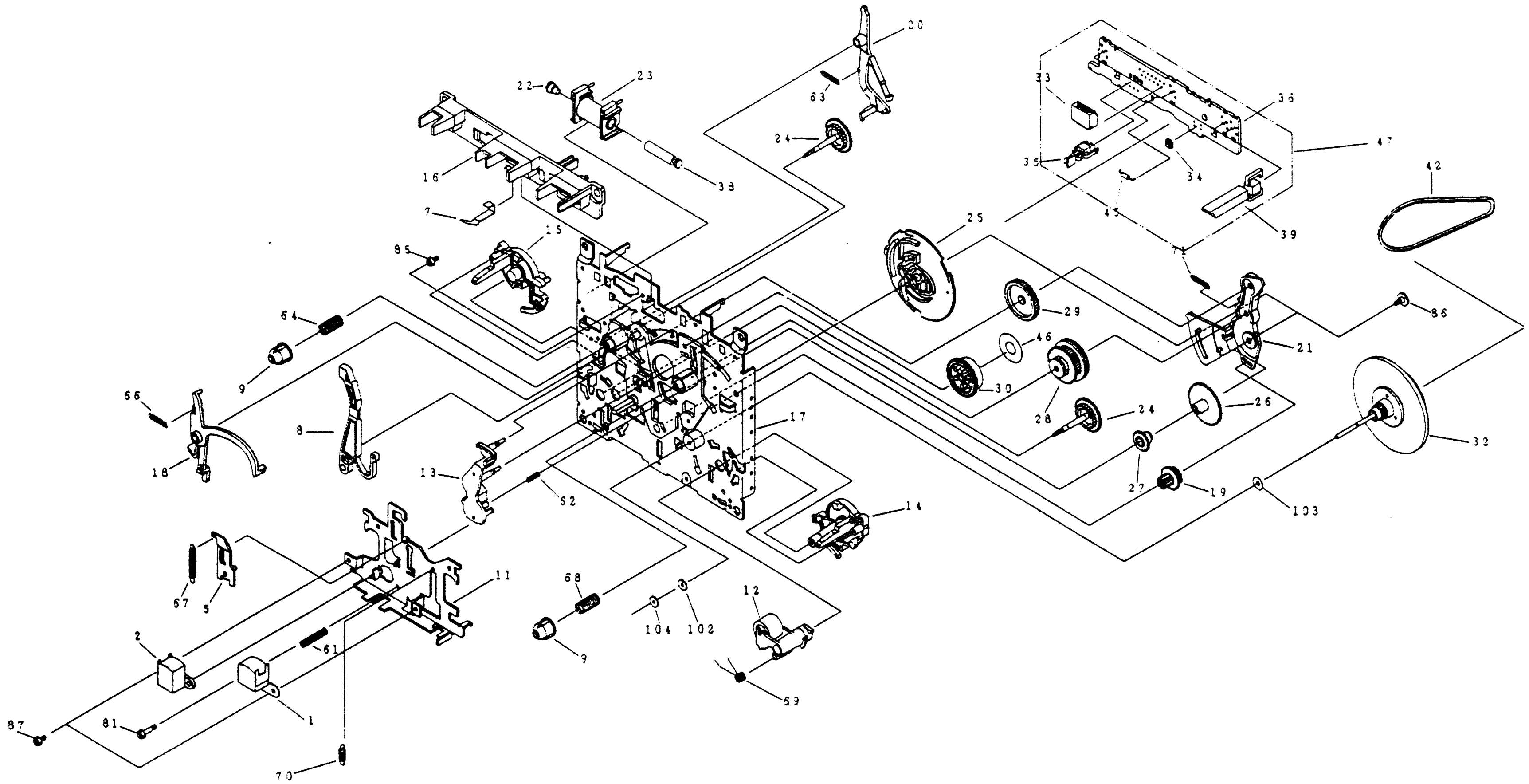
PCS 102546

CHIP LAYOUT

2621	A3	2698	C1	2727	C4	3604	A3	3643	A1	3676	A3	3712	C3	3736	C3	3763	C2	4602	A1	4710	B4	4734	C3	7630	C1
2622	A4	2699	A1	2728	B3	3605	A3	3644	A1	3678	A2	3713	C2	3737	C1	3765	C2	4603	A1	4711	A4	4735	C2	7631	A1
2623	A4	2701	C4	2729	B3	3606	A3	3645	B1	3679	A2	3714	C2	3738	C1	3766	C2	4604	A1	4712	B4	4736	C3	7632	A1
2624	A3	2702	C3	2730	B3	3608	A4	3646	B1	3680	A2	3715	C2	3739	C1	3767	C2	4605	B1	4713	A4	4737	C3	7633	A1
2625	A4	2703	C3	2733	C2	3610	A4	3647	B1	3683	A1	3716	C2	3740	C1	3768	C2	4606	B1	4714	A3	4738	C3	7634	A1
2631	C1	2704	C3	2734	C2	3612	A4	3648	B1	3684	A1	3717	B3	3741	C3	3769	B4	4607	B1	4715	B3	4739	C3	7635	A1
2632	B1	2705	C3	2735	C3	3613	A3	3649	B1	3686	A4	3718	C4	3742	C2	3770	B4	4608	C1	4716	B3	4740	B2	7636	B1
2633	B1	2706	C3	2737	C2	3614	A4	3650	B1	3687	A3	3719	B4	3743	B2	3771	B4	4609	B1	4717	B3	4741	C2	7637	A1
2634	B1	2707	C3	2738	C2	3616	A4	3651	C1	3689	C1	3720	B4	3744	C1	3772	A4	4610	C1	4718	B3	4742	C2	7638	A1
2635	B1	2708	C3	2742	B4	3618	A4	3657	A1	3691	C1	3721	B4	3745	C2	3774	B4	4691	C1	4719	B3	4743	C2	7640	B1
2636	B1	2709	C3	2743	C4	3623	A2	3658	A1	3692	C1	3722	B4	3746	C2	3775	C4	4693	C1	4720	B3	4781	A4	7710	C3
2639	A1	2710	C3	2744	B3	3624	A2	3659	A1	3695	B1	3723	C4	3748	C2	3776	B4	4694	C1	4721	B3	4783	A4	7720	C3
2640	B1	2711	C2	2745	B1	3625	A2	3660	A1	3696	C1	3724	B3	3749	B3	3777	B4	4695	C1	4722	B3	4785	A3	7730	B4
2643	A1	2712	C2	2760	B4	3626	A2	3661	A1	3701	C4	3725	B3	3751	A3	3779	C4	4696	B1	4723	B4	7610	A4	7740	B3
2644	B1	2717	B3	2769	B2	3628	A2	3662	B1	3702	C3	3726	B3	3752	A3	3780	C4	4697	C1	4724	B3	7612	A2	7780	A4
2645	A1	2718	C4	2770	B2	3630	A2	3663	A1	3703	C3	3727	B3	3753	A3	3781	C3	4701	A3	4725	B3	7613	A2	7781	B4
2646	B1	2719	B4	2781	C4	3631	B1	3664	B1	3704	C3	3728	B3	3754	A3	3782	B4	4702	A3	4726	B3	7614	A2	7783	B4
2649	A1	2720	B4	2782	B4	3632	B1	3665	A1	3705	C3	3729	B3	3755	A3	3783	C3	4703	A3	4727	C4	7616	A4	7784	C4
2650	B1	2721	B3	2786	C4	3633	A1	3666	B1	3706	C3	3730	B3	3756	A3	3784	C3	4704	A2	4728	C4	7618	A2	7787	C2
2651	A1	2722	B3	2787	C4	3634	A1	3667	A1	3707	C3	3731	B3	3757	A3	3786	A4	4705	A2	4729	C3	7619	A2	7788	C1
2652	B1	2723	B3	2788	C1	3637	A1	3668	A1	3708	C3	3732	B3	3758	A3	3787	A4	4706	A2	4730	B3	7620	A2	7789	C1
2653	A1	2724	B4	3601	A3	3638	A1	3669	A1	3709	C3	3733	B3	3759	A3	3788	C4	4707	A4	4731	B3	7622	A3	7790	C1
2654	A1	2725	B4	3602	A3	3639	A1	3670	B1	3710	C3	3734	C3	3760	B3	3789	B4	4708	A4	4732	B3	7623	A3	7791	A3
2697	C1	2726	B4	3603	A3	3640	A1	3672	A4	3711	C3	3735	C3	3762	B4	4601	A1	4709	A4	4733	C3	7624	A4	7792	A3



TAPE MECHANISM A - PLAY


20
22
23
63
24
33
36
47
16
38
34
35
7
42
45
25
39
15
85
71
29
86
64
46
21
30
66
9
28
24
26
8
17
32
18
13
27
19
62
103
14
11
68
12
67
5
104
102
2
61
9
81
1
69
87
70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
2	4822 249 30146	Dummy Head
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
32	4822 528 11209	Assembly Flywheel RV
33	4822 265 11207	Connector Socket 6 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 278 90613	Leaf Switch
42	*4822 358 10168*	*Belt AF 40mm*
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

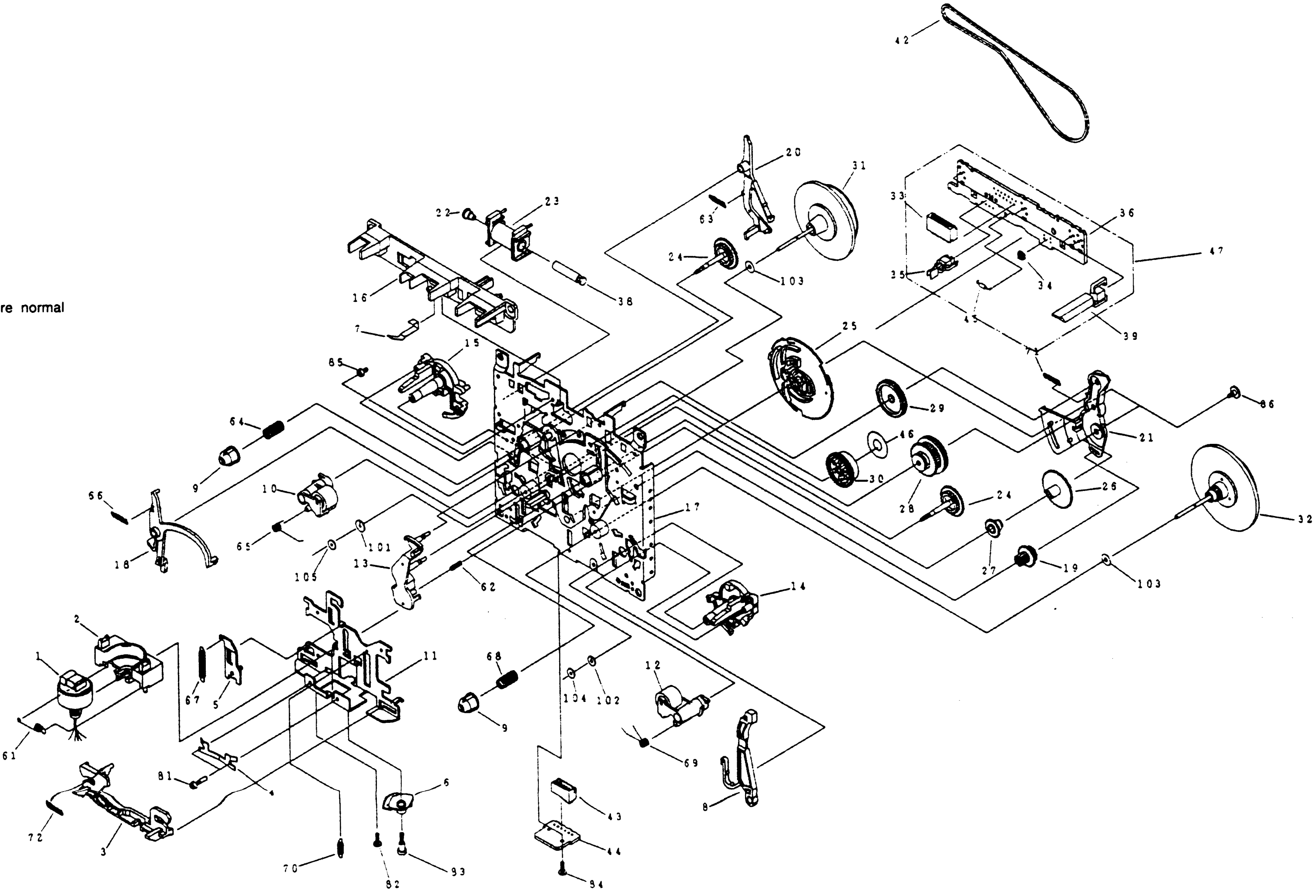
Note: Only the parts mentioned in this list are normal service spare parts.

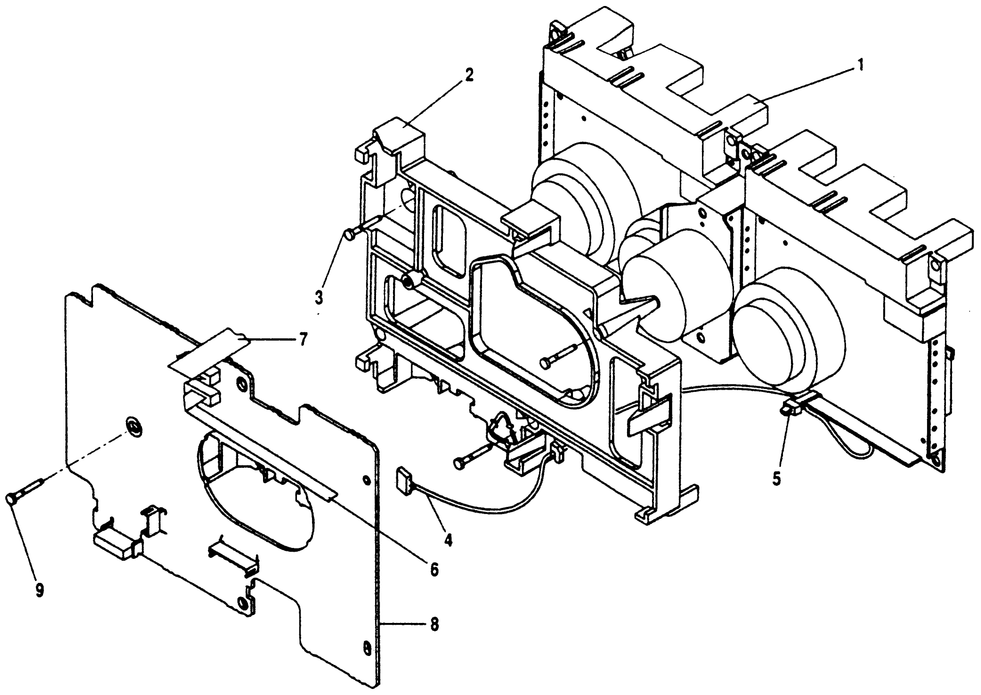
TAPE MECHANISM B - RECORD/PLAYBACK

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10521	Record/Playback Head
10	4822 528 10975	Assembly Arm Pinch L
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
31	4822 528 11211	Assembly Flywheel LV
32	4822 528 11209	Assembly Flywheel RV
33	4822 265 11208	Connector Socket 10 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


42
20
31
33
36
47
63
22
23
24
103
35
34
45
39
16
38
7
25
71
85
15
29
66
64
46
21
9
10
30
56
28
24
26
32
17
65
101
27
19
18
105
13
62
103
14
2
11
1
68
12
67
5
104
102
9
61
81
69
4
6
8
72
43
3
70
44
82
83
84



ETF5 TAPE MODULE EXPLODED VIEW

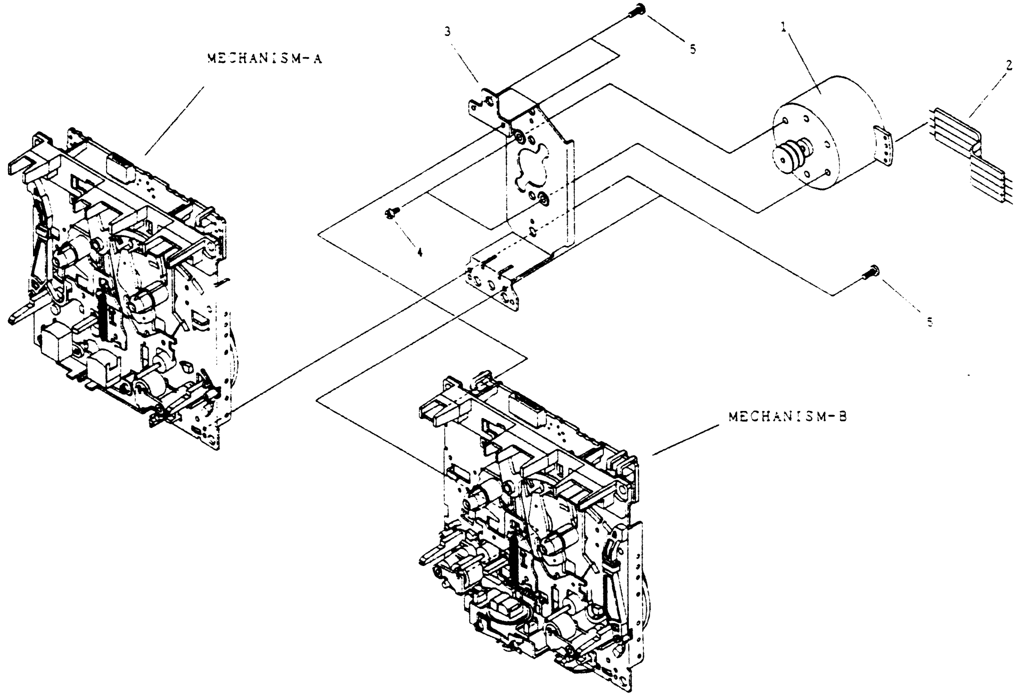
1	4822 691 10671	Tape Mechanism CWB44FR502
3	-	Screw M2 x 16
6	4822 320 12243	Flex Cable 6 pin 18 cm
7	4822 320 12242	Flex Cable 10 pin 7,5 cm
9	-	Screw D3 x 10

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A & B EXPLODED VIEW

1	4822 361 10841	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.



MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7pin Vert.
1706	4822 267 10953	Flex Socket 7pin Vert.
1740	4822 267 10729	Flex Socket 10pin Vert.
1750	4822 267 10731	Flex Socket 6pin Vert.

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	4822 122 33575	220pF 5% 63V
2624	4822 126 13196	100nF 10% 25V
2625	4822 126 13196	100nF 10% 25V
2631	4822 126 12944	47nF 10% 50V
2632	4822 126 12944	47nF 10% 50V
2633	4822 126 13473	220nF +80/-20% 50V
2634	4822 126 13473	220nF +80/-20% 50V
2635	4822 122 33891	3,3nF 10% 63V
2636	4822 122 33891	3,3nF 10% 63V
2637	5322 121 42386	100nF 5% 63V
2638	5322 121 42386	100nF 5% 63V
2639	5322 122 32531	100pF 5% 50V
2640	5322 122 32531	100pF 5% 50V
2641	4822 124 40769	4,7µF 20% 100V
2642	4822 124 40769	4,7µF 20% 100V
2643	4822 126 12105	33nF 5% 50V
2644	4822 126 12105	33nF 5% 50V
2645	5322 122 32658	22pF 5% 50V
2646	5322 122 32658	22pF 5% 50V
2647	4822 124 40769	4,7µF 20% 100V
2648	4822 124 40769	4,7µF 20% 100V
2649	5322 122 33861	120pF 10% 50V
2650	5322 122 33861	120pF 10% 50V
2651	4822 126 10326	180pF 5% 63V
2652	4822 126 10326	180pF 5% 63V
2653	5322 122 34099	470pF 10% 63V
2654	5322 122 34099	470pF 10% 63V
2692	4822 124 41584	100µF 20% 10V
2693	4822 124 81029	100µF 20% 25V
2694	4822 124 81029	100µF 20% 25V
2695	4822 124 41576	2,2µF 20% 50V
2696	4822 124 41576	2,2µF 20% 50V
2701	4822 122 33805	330pF 10% 63V
2702	4822 122 33805	330pF 10% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	5322 122 31863	330pF 5% 63V
2706	5322 122 31863	330pF 5% 63V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 63V
2710	5322 122 31863	330pF 5% 63V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 41584	100µF 20% 10V
2716	4822 124 41584	100µF 20% 10V
2717	4822 122 33175	2,2nF 20% 50V
2718	4822 122 33175	2,2nF 20% 50V
2719	4822 126 13188	15nF 5% 63V
2720	4822 126 13188	15nF 5% 63V
2727	4822 122 32535	680pF 10% 63V
2728	4822 122 32535	680pF 10% 63V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13196	100nF 10% 25V
2737	4822 126 13196	100nF 10% 25V
2738	4822 126 13196	100nF 10% 25V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	4822 126 13196	100nF 10% 25V
2744	4822 126 13196	100nF 10% 25V
2760	4822 126 13196	100nF 10% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40769	4,7µF 20% 100V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 50V
2788	5322 122 34123	1nF 10% 50V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W

3616	4822 051 20822	8k2 5% 0,1W
3618	4822 051 20822	8k2 5% 0.1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3622	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3631	4822 117 10834	47k 1% 0,1W
3632	4822 117 10834	47k 1% 0,1W
3633	4822 051 20332	3k3 5% 0,1W
3634	4822 051 20332	3k3 5% 0,1W
3635	4822 100 11771	Trimmer 20k 30% 0,1W
3636	4822 100 11771	Trimmer 20k 30% 0,1W
3637	4822 051 20104	100k 5% 0,1W
3638	4822 051 20104	100k 5% 0,1W
3639	4822 051 20332	3k3 5% 0,1W
3640	4822 051 20332	3k3 5% 0,1W
3641	4822 100 11771	Trimmer 20k 30% 0,1W
3642	4822 100 11771	Trimmer 20k 30% 0,1W
3643	4822 051 20104	100k 5% 0,1W
3644	4822 051 20104	100k 5% 0,1W
3645	4822 051 20683	68k 5% 0,1W
3646	4822 051 20683	68k 5% 0,1W
3647	4822 051 20332	3k3 5% 0,1W
3648	4822 051 20332	3k3 5% 0,1W
3649	4822 051 20562	5k6 5% 0,1W
3650	4822 051 20562	5k6 5% 0,1W
3651	4822 051 10102	1k 2% 0,25W
3652	4822 050 11002	1k 1% 0,4W
3655	5322 100 11542	Trimmer 4k7 30% 0,1W
3656	5322 100 11542	Trimmer 4k7 30% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 051 10102	1k 2% 0,25W
3659	4822 051 20223	22k 5% 0,1W
3660	4822 051 20223	22k 5% 0,1W
3661	4822 051 20474	470k 5% 0,1W
3662	4822 051 20474	470k 5% 0,1W
3663	4822 051 20154	150k 5% 0,1W
3664	4822 051 20154	150k 5% 0,1W
3665	4822 051 20683	68k 5% 0,1W
3666	4822 051 20683	68k 5% 0,1W
3667	4822 051 20109	10R 5% 0,1W
3668	4822 051 20109	10R 5% 0,1W
3669	4822 051 20472	4k7 5% 0,1W
3670	4822 051 20472	4k7 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3683	4822 117 10834	47k 1% 0,1W
3684	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3691	4822 117 10833	10k 1% 0,1W
3692	4822 117 10965	18k 1% 0,1W
3693	4822 116 52199	68R 5% 0,5W
3694	4822 052 10109 △	10R 5% 0,33W
3695	4822 117 12521	68R 1% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3703	4822 117 11503	220R 1% 0.1W
3704	4822 117 11503	220R 1% 0.1W
3705	4822 117 11503	220R 1% 0.1W
3706	4822 117 11503	220R 1% 0.1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W
3709	4822 051 20229	22R 5% 0,1W
3710	4822 051 20229	22R 5% 0,1W
3711	4822 051 20104	100k 5% 0,1W
3712	4822 051 20104	100k 5% 0,1W
3713	4822 051 20121	120R 5% 0,1W
3714	4822 051 20121	120R 5% 0,1W
3715	4822 051 10102	1k 2% 0,25W
3716	4822 051 10102	1k 2% 0,25W
3717	4822 051 20392	3k9 5% 0,1W
3718	4822 051 20392	3k9 5% 0,1W
3719	4822 051 20822	8k2 5% 0,1W
3720	4822 051 20822	8k2 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W
3724	4822 117 11383	12k 1% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 051 20562	5k6 5% 0,1W
3732	4822 051 20562	5k6 5% 0,1W
3733	4822 051 20562	5k6 5% 0,1W
3734	4822 051 20562	5k6 5% 0,1W
3735	4822 051 20153	15k 5% 0,1W
3736	4822 051 20153	15k 5% 0,1W
3737	4822 051 20332	3k3 5% 0,1W
3738	4822 051 20332	3k3 5% 0,1W
3739	4822 051 20472	4k7 5% 0,1W
3740	4822 117 10834	47k 1% 0,1W
3741	4822 117 11454	820R 1% 0,1W
3742	4822 117 11454	820R 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W

ELECTRICAL PARTS LIST - ETF5.. DOLBY BOARD

RESISTORS

3744	4822 051 20122	1k2 5% 0,1W
3745	4822 051 20392	3k9 5% 0,1W
3746	4822 051 20392	3k9 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20333	33k 5% 0,1W
3756	4822 117 13579	220k 1% 0,1W
3757	4822 117 13579	220k 1% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 10833	10k 1% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20562	5k6 5% 0,1W
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 051 20822	8k2 5% 0,1W
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 △	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3782	4822 051 20153	15k 5% 0,1W
3783	4822 051 20472	4k7 5% 0,1W
3784	4822 051 20472	4k7 5% 0,1W
3785	5322 100 11539	Trimmer 100k 30% 0,1W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4604	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	*4822 051 20008*	*0R Jumper 0805*
4608	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4696	4822 051 20008	0R Jumper 0805
4697	4822 051 20008	0R Jumper 0805
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805
4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4743	4822 051 20008	0R Jumper 0805
4783	4822 051 20008	0R Jumper 0805
4785	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5631	4822 157 11865	MPX Filter 20kHz
5632	4822 157 11865	MPX Filter 20kHz
5701	4822 157 11477	Coil 2,2µH 5%

ELECTRICAL PARTS LIST - ETF5.. DOLBY BOARD

5702	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Osc. Coil 100kHz

DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6613	4822 130 32245	BYV10-40
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7630	4822 209 17322	CXA1551M
7631	4822 130 60511	BC847B
7632	4822 130 60511	BC847B
7633	4822 130 60511	BC847B
7634	4822 130 60511	BC847B
7635	4822 130 60511	BC847B
7636	4822 130 60511	BC847B
7637	4822 130 60511	BC847B
7638	4822 130 60511	BC847B
7640	4822 209 83357	NJM4560M
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 60511	BC847B
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7785	4822 130 63494	J111
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7788	4822 130 60511	BC847B
7789	4822 130 60511	BC847B
7790	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.

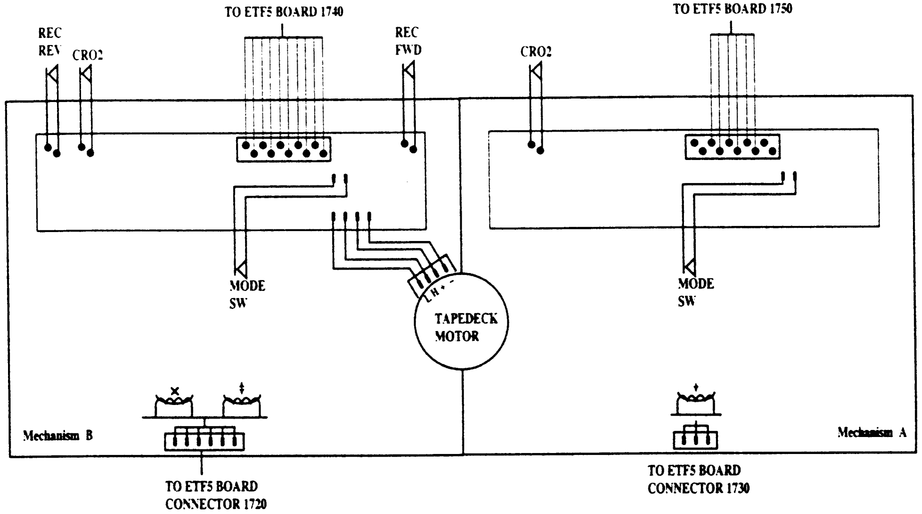
ETF5-FE TAPE MODULE

(Dolby Version)

TABLE OF CONTENTS

Tape Module Wiring & variation table 9-1
Block diagram 9-2
Brief Introduction 9-3
Connector assignment.. 9-4
Tape adjustments & Tape deck electronics 9-5
ETF Dolby board layouts 9-6
Analog Circuit diagram 9-7
Servo Circuit diagram 9-8
Dolby Circuit diagram 9-9
Exploded views & parts list....................................... 9-10
Electrical parts list.. 9-13

Tapedeck wiring (Double deck)

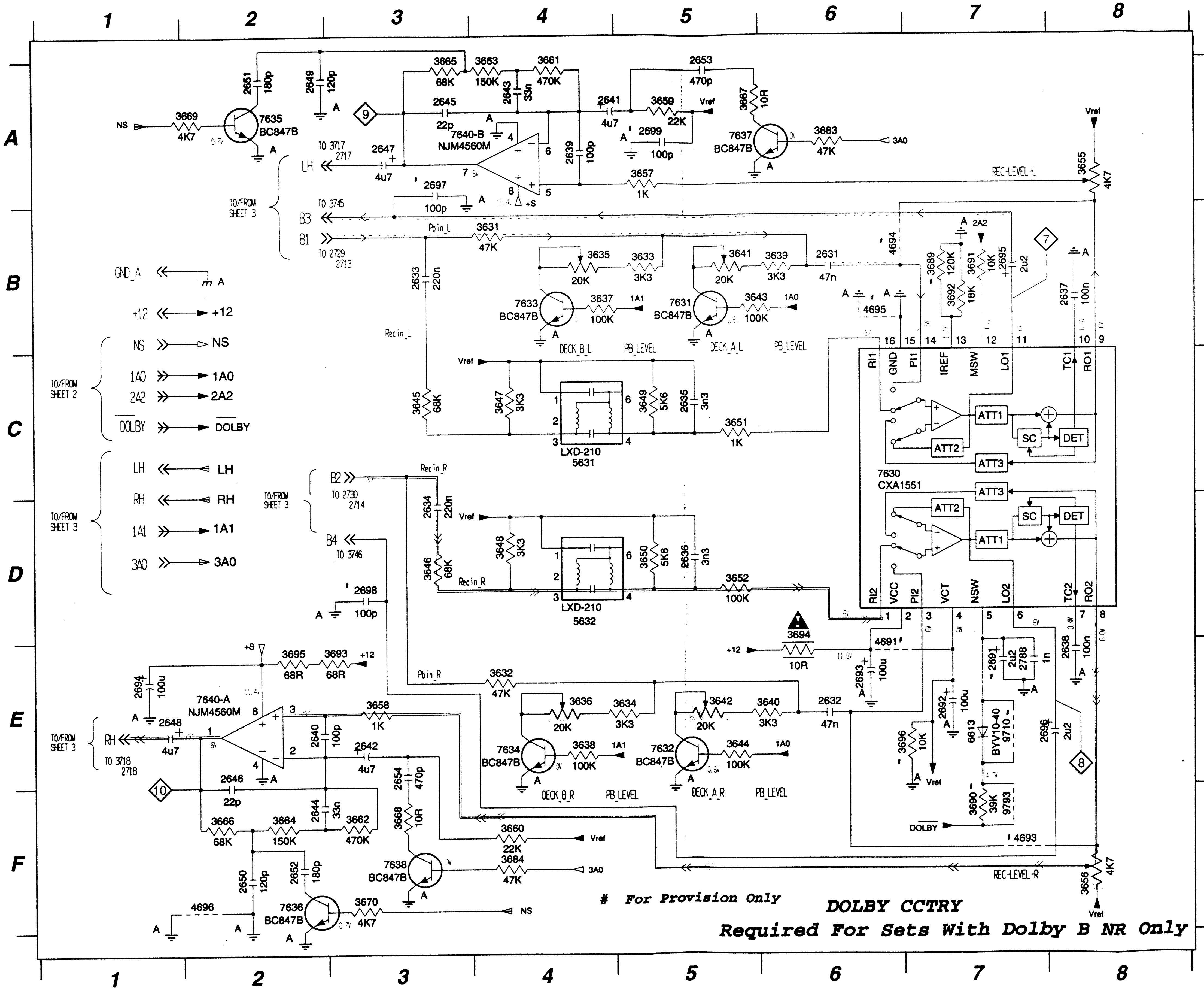

TO ETF5 BOARD 1740
REC REV
CRO2
REC FWD
CRO2
TO ETF5 BOARD 1750
MODE SW
L H + -
TAPEDECK MOTOR
MODE SW
Mechanism B
TO ETF5 BOARD CONNECTOR 1720
Mechanism A
TO ETF5 BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

MODULE	ETF5-FE		ETF5A-FE			
VARIANT	1	2	3	4		
NAME	DB/DD/FR	ND/DD/FR	DB/DD/FR	ND/DD/FR		
Deck configuration	double	double	double	double		
Autoreverse	yes (B)	yes (B)	yes (B)	yes (B)		
Auto-replay	no	no	no	no		
Motor configuration	single	single	single	single		
Auto tape type selection	yes	yes	yes	yes		
Dolby B type Noise Reduction	yes	no	yes	no		
19 kHz pilot suppression	yes	no	yes	no		
High speed dubbing	yes	yes	yes	yes		

DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

DOLBY CIRCUIT

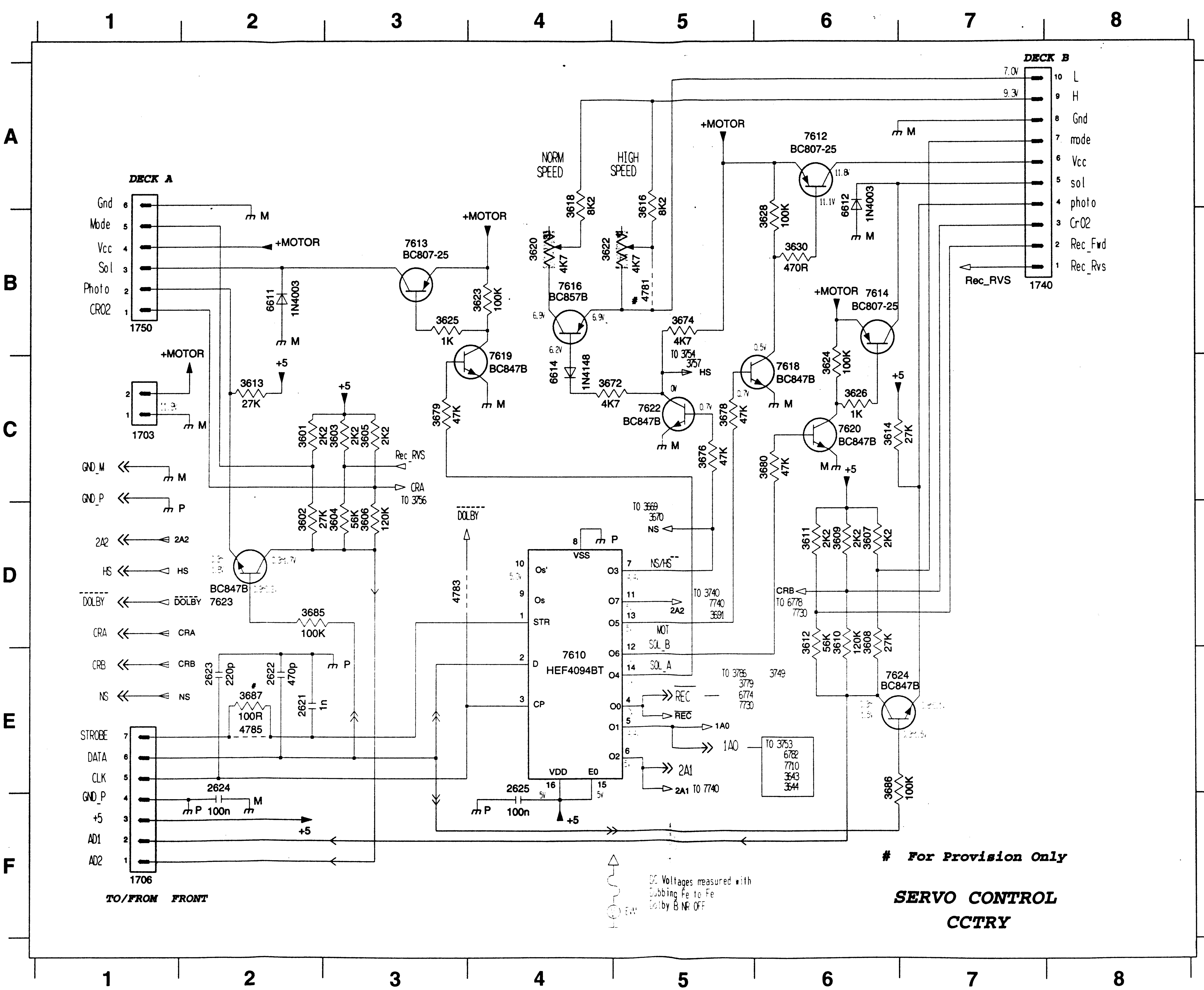


1 2 3 4 5 6 7 8
A B C D E F
NS
3669 4K7
7635 BC847B
2651 180p
2649 120p
3665 68K
3663 150K
3661 470K
2643 33n
2645 22p
7640-B NJM4560M
TO 3717 2717
2647 4u7
LH
2697 100p
2639 100p
2653 470p
2641 4u7
3659 22K
Vref
2699 100p
3667 10R
7637 BC847B
3683 47K
3A0
3657 1K
REC-LEVEL-L
3655 4K7
TO/FROM SHEET 3
B3
B1
TO 3745
TO 2729 2713
Pbin_L
3631 47K
2633 220n
3635 20K
3633 3K3
3641 20K
3639 3K3
2631 47n
4694
3689 120K
3691 10K
2695 2u2
3692 18K
2A2
4695
2637 100n
7633 BC847B
3637 100K
1A1
7631 BC847B
3643 100K
1A0
DECK_B_L
PB_LEVEL
DECK_A_L
Recin_L
GND_A
+12
NS
1A0
2A2
DOLBY
TO/FROM SHEET 2
LH
RH
1A1
3A0
TO/FROM SHEET 3
3645 68K
3647 3K3
3649 5K6
2635 3n3
3651 1K
LXD-210 5631
LXD-210 5632
RI1 GND PI1 IREF MSW LO1 TC1 RO1
ATT1 ATT2 ATT3 SC DET
7630 CXA1551
RI2 VCC PI2 VCT NSW LO2 TC2 RO2
B2
TO 2730 2714
B4
TO 3746
Recin_R
2634 220n
3648 3K3
3646 68K
3650 5K6
2636 3n3
3652 100K
2698 100p
3694 10R
4691
2693 100u
2638 100n
2691 2u2
2788 1n
2692 100u
6613
BYV10-40 9710
3696 10K
3690 39K
9793
DOLBY
4693
2696 2u2
+S
3695 68R
3693 68R
2694 100u
7640-A NJM4560M
2648 4u7
RH
TO 3718 2718
3658 1K
2640 100p
2642 4u7
Pbin_R
3632 47K
3636 20K
3634 3K3
3642 20K
3640 3K3
2632 47n
7634 BC847B
3638 100K
7632 BC847B
3644 100K
DECK_B_R
DECK_A_R
2646 22p
2654 470p
3666 68K
3664 150K
2644 33n
3662 470K
3668 10R
3660 22K
3684 47K
7638 BC847B
2650 120p
2652 180p
4696
7636 BC847B
3670 4K7
REC-LEVEL-R
3656 4K7
# For Provision Only
DOLBY CCTRY
Required For Sets With Dolby B NR Only

– → – Signal path Pb left channel

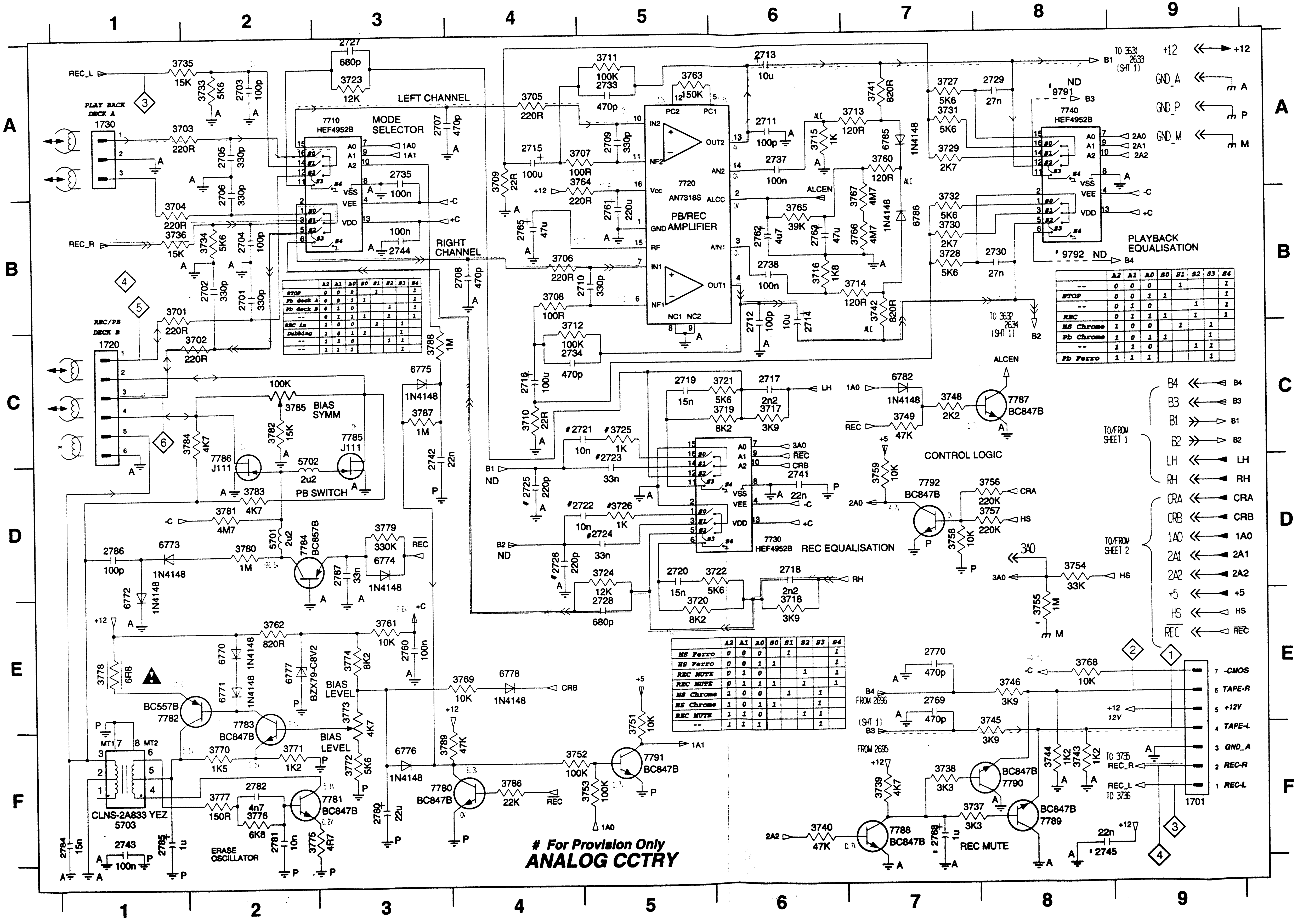
2631	B6
2632	E6
2633	B3
2634	D3
2635	C5
2636	D5
2637	B8
2638	E8
2639	A4
2640	E2
2641	A4
2642	E3
2643	A4
2644	F2
2645	A3
2646	E2
2647	A3
2648	E1
2649	A2
2650	F2
2651	A2
2652	F2
2653	A5
2654	E3
2691	E7
2692	E7
2693	E6
2694	E1
2695	B7
2696	E7
2697	A3
2698	D3
2699	A5
2788	E7
3631	B4
3632	E4
3633	B5
3634	E5
3635	B4
3636	E4
3637	B4
3638	E4
3639	B6
3640	E6
3641	B5
3642	E5
3643	B5
3644	E5
3645	C3
3646	D3
3647	C4
3648	D4
3649	C5
3650	D5
3651	C5
3652	D5
3655	A8
3656	F8
3657	A5
3658	E3
3659	A5
3660	F4
3661	A4
3662	F3
3663	A4
3664	F2
3665	A3
3666	F2
3667	A5
3668	F3
3669	A2
3670	F3
3683	A6
3684	F4
3689	B7
3690	F7
3691	B7
3692	B7
3693	E3
3694	D6
3695	E2
3696	E6
4691	E6
4693	F7
4694	B6
4695	B6
4696	F2
5631	C4
5632	D4
6613	E7
7630	C6
7631	B5
7632	E5
7633	B4
7634	E4
7635	A2
7636	F2
7637	A5
7638	F3
7640-A	E2
7640-B	A4
9710	E7
9793	F7

SERVO CONTROL CIRCUIT


1
2
3
4
5
6
7
8
A
B
C
D
E
F
DECK A
Gnd
Mode
Vcc
Sol
Photo
CR02
1750
M
+MOTOR
6611
1N4003
1703
11.9V
GND_M
GND_P
2A2
HS
DOLBY
CRA
CRB
NS
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
TO/FROM FRONT
3613
27K
3601
2K2
3603
2K2
3605
2K2
Rec_RVS
CRA
TO 3756
3602
27K
3604
56K
3606
120K
BC847B
7623
3685
100K
2623
220p
2622
470p
2621
1n
3687
100R
4785
2624
100n
7613
BC807-25
3625
1K
3623
100K
7619
BC847B
3679
47K
DOLBY
4783
NORM SPEED
HIGH SPEED
3618
8K2
3616
8K2
3620
4K7
3622
4K7
4781
7616
BC857B
6614
1N4148
3672
4K7
3674
4K7
TO 3754
3757
7622
BC847B
TO 3669
3670
NS
7610
HEF4094BT
VSS
VDD
E0
Os'
Os
STR
D
CP
O3
O7
O5
O6
O4
O0
O1
O2
NS/HS
2A2
MOT
SOL_B
SOL_A
TO 3740
7740
3691
TO 3785
3779
6774
7730
3749
REC
REC
1A0
1A0
TO 3753
6782
7710
3643
3644
2A1
2A1 TO 7740
2625
100n
+MOTOR
7612
BC807-25
3628
100K
3630
470R
6612
1N4003
3676
47K
3678
47K
7618
BC847B
3680
47K
7614
BC807-25
3624
100K
3626
1K
7620
BC847B
3614
27K
3611
2K2
3609
2K2
3607
2K2
CRB
TO 6778
7730
3612
56K
3610
120K
3608
27K
7624
BC847B
3686
100K
DECK B
7.0V
9.3V
L
H
Gnd
mode
Vcc
sol
photo
Cr02
Rec_Fwd
Rec_Rvs
Rec_RVS
1740
# For Provision Only
SERVO CONTROL CCTRY
DC Voltages measured with Dubbing Fe to Fe Dolby B NR OFF

1703	C1
1706	F1
1740	B8
1750	B1
2621	E2
2622	E2
2623	E2
2624	E2
2625	E4
3601	C2
3602	D2
3603	C3
3604	D3
3605	C3
3606	D3
3607	D6
3608	D6
3609	D6
3610	D6
3611	D6
3612	D6
3613	C2
3614	C6
3616	A5
3618	A4
3620	B4
3622	B4
3623	B4
3624	C6
3625	B3
3626	C6
3628	B6
3630	B6
3672	C4
3674	B5
3676	C5
3678	C5
3679	C3
3680	C6
3685	D2
3686	E6
3687	E2
4781	B5
4783	D3
4785	E2
6611	B2
6612	A6
6614	C4
7610	E4
7612	A6
7613	B3
7614	B6
7616	B4
7618	C6
7619	C4
7620	C6
7622	C5
7623	D2
7624	E6

ANALOG CIRCUIT

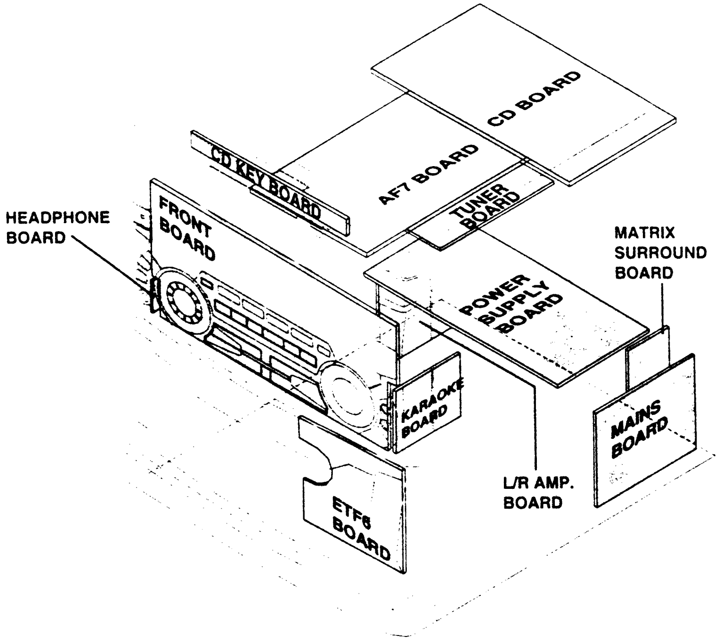


1 2 3 4 5 6 7 8 9
A B C D E F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1720
LEFT CHANNEL
RIGHT CHANNEL
7710 HEF4952B
MODE SELECTOR
7720 AN7318S
PB/REC AMPLIFIER
7740 HEF4952B
PLAYBACK EQUALISATION
7730 HEF4952B
REC EQUALISATION
BIAS SYMM
PB SWITCH
BIAS LEVEL
ERASE OSCILLATOR
CLNS-2A833 YEZ 5703
CONTROL LOGIC
REC MUTE
ALCEN
TO/FROM SHEET 1
TO/FROM SHEET 2
1701
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
+12
GND_A
GND_P
GND_M
# For Provision Only
ANALOG CCTRY

1701 F9	3714 B7	3787
1720 C1	3715 A6	3788
1730 A1	3716 B6	3789
2701 B2	3717 C6	5701
2702 B2	3718 E6	5702
2703 A2	3719 C6	5703
2704 B2	3720 E5	6770
2705 A2	3721 C6	6771
2706 A2	3722 D6	6772
2707 A3	3723 A3	6773
2708 B4	3724 D5	6774
2709 A5	3725 C5	6775
2710 B5	3726 D5	6776
2711 A6	3727 A7	6777
2712 B6	3728 B7	6778
2713 A6	3729 A7	6782
2714 B6	3730 B7	6785
2715 A4	3731 A7	6786
2716 C4	3732 B7	7710
2717 C6	3733 A2	7720
2718 D6	3734 B2	7730
2719 C5	3735 A2	7740
2720 D5	3736 B1	7780
2721 C5	3737 F7	7781
2722 D5	3738 F7	7782
2723 C5	3739 F7	7783
2724 D5	3740 F6	7784
2725 D4	3741 A7	7785
2726 D4	3742 B7	7786
2727 A3	3743 F8	7787
2728 E5	3744 F8	7788
2729 A8	3745 E8	7789
2730 B8	3746 E8	7790
2733 A5	3748 C7	7791
2734 C4	3749 C7	7792
2735 A3	3751 E5	9791
2737 A6	3752 F4	9792
2738 B6	3753 F5	
2741 D6	3754 D8	
2742 C3	3755 E8	
2743 F1	3756 D8	
2744 B3	3757 D8	
2745 F9	3758 D7	
2760 E3	3759 D7	
2761 B5	3760 A7	
2762 B6	3761 E3	
2763 B6	3762 E2	
2765 B4	3763 A5	
2768 F7	3764 A5	
2769 E7	3765 B6	
2770 E7	3766 B7	
2780 F3	3767 B7	
2781 F2	3768 E8	
2782 F2	3769 E4	
2784 F1	3770 F2	
2785 F1	3771 F2	
2786 D1	3772 F3	
2787 D3	3773 E3	
3701 B1	3774 E3	
3702 C2	3775 F2	
3703 A2	3776 F2	
3704 B1	3777 F2	
3705 A4	3778 E1	
3706 B4	3779 D3	
3707 A5	3780 D2	
3708 B4	3781 D2	
3709 A4	3782 C2	
3710 C4	3783 D2	
3711 A5	3784 C2	
3712 C4	3785 C2	
3713 A7	3786 F4	

DC Voltages measured [illegible]

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FW830C							
	/21	/37						
Aux In	x	x						
Line Out	x	x						
Surround Out								
Subwoofer Out	x	x						
Digital Out	x	x						
Matrix Surround		x						
CD Text								
Dolby B								
RDS								
News								
Dolby Prologic (DPL)								
Karaoke Features	x	x						
Voltage Selector	x							
Low Power Standby / LED		x						
Tuner board - ECO5 Sys	X	X						
Tuner board - Tuner 95								
Surround Loudspeakers		x						

SPECIFICATIONS

GENERAL:

Mains voltage	: 100V for /26 110-127V/220-240V Switchable for /21/21M 120V for /37 220V for /33 220-230V for /22/34 230V for /25 230-240V for /30
Mains frequency	: 50/60Hz
Power consumption	: < 18W at Standby < 180W at 1/8 rated power out
Clock accuracy	: < 4 seconds per day
Dimension centre unit	: 265 x 310 x 390mm

TUNER:

FM

Tuning range	: 87.5-108MHz 65.81-74MHz for /34
Grid	: 50kHz (& 30kHz for /34)
IF frequency	: 10.7MHz ± 25kHz
Aerial input	: 75ohm coaxial 300ohm click fit for /37
Sensitivity at 26dB S/N	: < 7µV
Selectivity at 600kHz bandwidth	: > 50dB
Image rejection	: > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz	: < 3% [< 2%]
-3dB Limiting point	: < 7µV
Crosstalk at RF=1mV, dev. 40kHz	: > 18dB [> 26dB]

MW

Tuning range	: 531-1602kHz 530-1700kHz for /21/21M/37
Grid	: 9kHz 10kHz for /21/21M/37
IF frequency	: 450kHz ± 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: < 4.0mV/M
Selectivity at 18kHz bandwidth	: > 18dB
IF rejection	: > 45dB
Image rejection	: > 28dB
Distortion at RF=50mV, m=80%	: < 5% [< 7%]

LW

Tuning range	: 153-279kHz
Grid	: 3kHz
IF frequency	: 450kHz ± 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: [< 7.0mV/M]
Selectivity at 18kHz bandwidth	: [> 24dB]
IF rejection	: [> 26dB]
Image rejection	: [> 35dB]
Distortion at RF=50mV, m=80%	: [< 7%]

AMPLIFIER:

Output power (6ohm, 1kHz, 10% THD)

L & R	: 2 x 100W
Surround	: 2 x 20W

Frequency response within -3dB : 60Hz-16kHz

Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF [1]

Dynamic Sound Effect (DSE) :SURF, STROBE, PAN, HOLD

Digital Sound Control (DSC) :

Optimal, Classic, Techno, Jazz, Rock, Vocal [1]

Virtual Environmental Control (VEC) :

Hall, Disco, Concert, Club, Cinema, Arcade

Headphone output at 32 ohm : 15mW ± 2dB

Input sensitivity

Aux in	: 500mV ± 2dB at 1 kohm

Output sensitivity

Line out	: 440mV ± 2dB at 22 kohm
Subwoofer out (max. vol.)	: 1.5V ± 2dB at 22 kohm

CASSETTE RECORDER:

Number of track	: 2 x 2 stereo
Tape speed	: 4.76 cm/sec ±2% 1.6 x 4.76 cm/sec
Wow and flutter	: < 0.4% (DIN)
Fast-wind/Rewind time C60	: 130 sec
Bias system	: 75kHz ± 10kHz
Rec/Pb freq. response within 8dB	: 80Hz - 12.5kHz
Signal to noise ratio (IEC I)	: > 44dB
Signal to noise ratio (IEC II)	: > 47dB

COMPACT DISC:

Measurement done at output conn. of the CDC module.

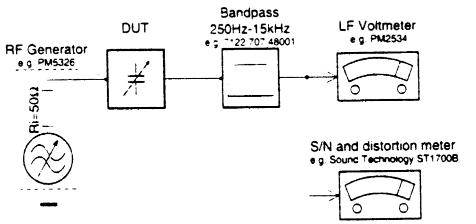
Frequency response within ± 1.5dB	: 20Hz - 20kHz
Output level (in Vrms)	: 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted)	: > 80dBA
Distortion at 1kHz	: < 0.5%
Channel difference at 1kHz	: < 1dB
Channel crosstalk at 1kHz	: > 60dB
De-emphasis	: 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

[1] Frequency response in each setting is software controlled.

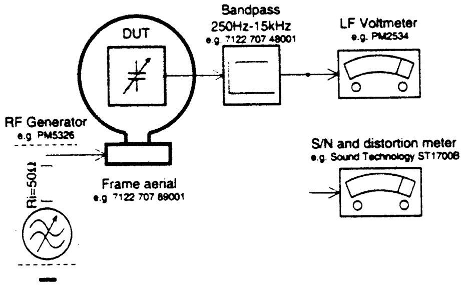
MEASUREMENT SETUP

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz. 100Hz) and disturbance from the pilottone (19kHz. 38kHz).

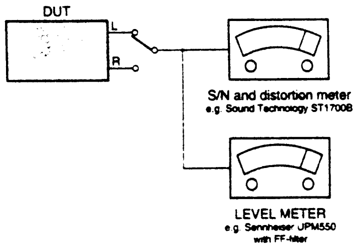
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

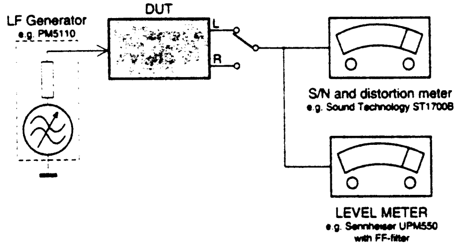
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette CrO2 SBC419 4822 397 30069
or Universal Test Cassette Fe SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

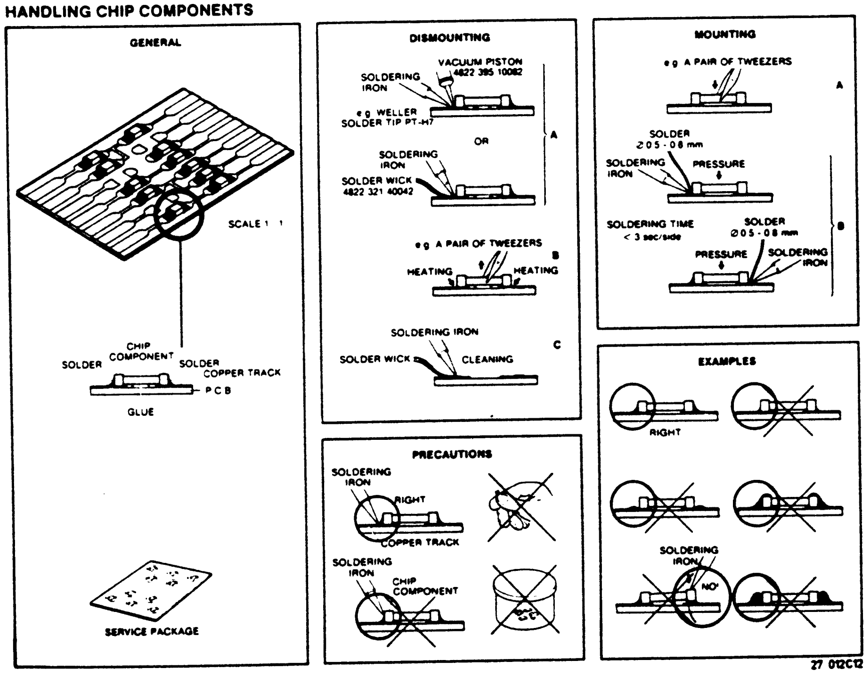
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
PCB
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK
4822 321 40042
A
e.g. A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
SOLDER WICK
CLEANING
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
Ø 0.5 - 0.8 mm
B
PRESSURE
SOLDERING IRON
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considerablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to *earth ground to assure no shock hazard exist.* The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning når apparaten år öppnad och spårren år urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

CONTENTS

GENERAL INFORMATION

[illegible]

IMPORTANT
PLEASE NOTE THAT THE VOLTAGE SELECTOR LOCATED AT THE REAR OF THIS SYSTEM IS PRESET AT 220V FROM THE FACTORY. FOR COUNTRIES THAT OPERATE AT 110V, PLEASE ADJUST TO 110V BEFORE YOU SWITCH ON THE SYSTEM.

General Information

- ***The typeplate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Accessories *(Supplied)*

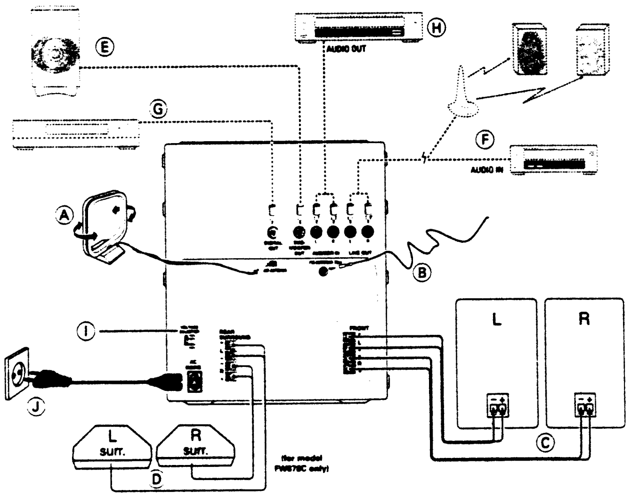
- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- SS30 surround speakers *(for model FW878C only)*

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- The system incorporates a built-in safety feature that prevents over heating.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATIONS

Rear Connections



A AM Loop Antenna Connection

Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

B FM Wire Antenna Connection

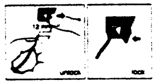
Connect the supplied FM wire antenna to the FM ANTENNA 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM ANTENNA 75 Ω terminal using a 75 Ω coaxial wire.

C Speakers Connection

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.



D Rear Speakers' Connection

(for model FW878C only)

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the white (marked wires) to the grey REAR SURROUND terminals.

E Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

F Line Out Connection *(wireless ready)*

You can connect the audio left and right LINE OUT terminals to a optional CD Recorder ANALOGUE IN terminals. This allows you to record in an analogue format.

You can also install additional optional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Note

- *Availability of a wireless transmitter and its peripherals is subjected to the approval of local authorities. Please check with your local safety or approving authority.*

G Digital Out Connection

You can record the digital sound from the CD, through this output, on any audio equipment with digital input (e.g. CD Recorder, Digital Audio Tape (DAT) deck, Digital to Analog Converter and Digital Signal Processor).

Connect one end of the cinch cable (not supplied) to the DIGITAL OUT socket and the other end to the audio equipment with digital input. When connecting the cinch cable, make sure it is fully inserted.

H Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD-Recorder to the AUX/CDR IN terminals at the rear of the system.

I Adjusting the Operating Voltage *(not available for all versions)*

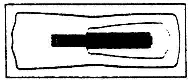
Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

J AC Power Supply

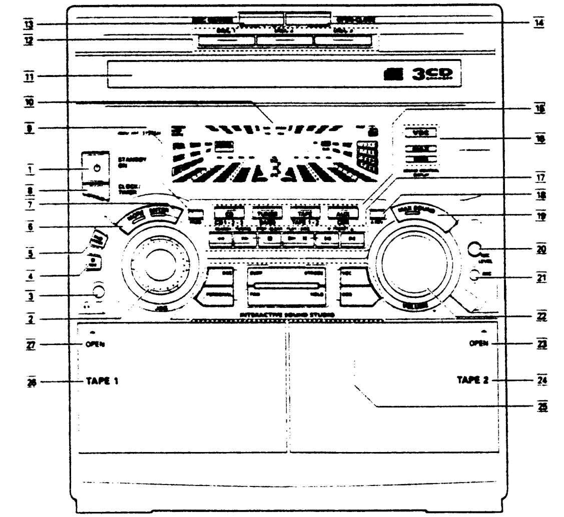
After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

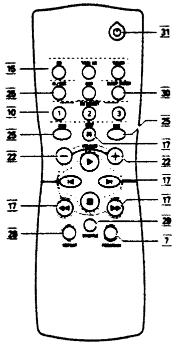
Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.





Controls on the system and remote control

1 STANDBY ON
- to switch the system on or to standby mode.
- to use for EASY SET

2 JOG
- to select the desired equalizer display
- to select the desired DSC setting. You must select the DSC feature first
- to select the desired level of Personal Sound. You must select the PERSONAL Sound setting first.
- to select the desired VEC setting. You must select the VEC feature first

3 🎧
- to connect headphones.

4 REC (RECORD)
- to start recording on tape deck 2

5 DUB (HIGH SPEED DUBBING [HSD])
- to dub a tape in normal or fast speed.

6 MORE
- to switch the calibration status on or off.
- to select personal equalizer band for adjustment.
- to select personal equalizer setting for storing.

7 ENTER
- to confirm the calibration status.
- to store the personal equalizer band.
- to store and confirm the personal equalizer setting.

8 CLOCK/TIMER
- to view the clock, set the clock or set the timer.

9 PROG (PROGRAM)
- to program CD tracks in CD mode or preset radio stations in tuner mode

10 DISPLAY
- to view the current setting of the system

11 CD CAROUSEL TRAY

12 CD DIRECT PLAY (DISC 1 / DISC 2 / DISC 3)
- to select a CD tray for playback

13 DISC CHANGE
- to change CD(s).

14 OPEN•CLOSE
- to open or close the CD carousel

15 SOURCE to select the following

CD / (CD 1•2•3)
- to select CD mode. When CD playback is stopped, press to select the disc tray 1, 2 or 3

TUNER / (BAND)
- to select Tuner mode. When in Tuner mode, press to select the waveband FM or MW

TAPE / (TAPE 1• 2)
- to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.

AUX / (CDR)
- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder). When in Aux mode, press to select either AUX or CDR.

16 SOUND DISPLAY PANEL
- to view the selected Interactive Sound Studio setting.

17 MODE SELECTION

◀◀ ▶▶ (SEARCH •TUNING)

for CD .... to search backward/ forward.
for TUNER .... to tune to a lower or higher radio frequency.
for TAPE ...... to rewind or fast forward a tape on tape deck 2 only.

■ (STOP•CLEAR)

for CD .... to stop CD playback or to clear a program.
for TUNER ... to stop programming.
for TAPE ..... to stop playback or recording.
DEMO .... *(on the system only)* to start or stop demonstration mode

▶ II (PLAY •SIDE)

for CD .... to start or interrupt playback.
for TAPE .... to start playback.
.... SIDE : When playing in Tape 2 mode, to change side.

I◀ ▶I (PRESET ▼▲)

for CD .... to skip to the beginning of the current, previous, or next track.
for TUNER ..... to select a preset radio station in memory.

18 A. REV (AUTO REVERSE)
- available in tape deck 2 only.
- to select the desired play modes (⊐ / ⊃ / ⊂⊃).

19 MAX SOUND
- to switch on or off MAX sound for extra bass.

20 MIC LEVEL
- to adjust the mixing level for karaoke or microphone recording.

21 MIC
- to connect microphone jack.

22 VOLUME
- to adjust the volume.

23 OPEN
- to open tape deck 2

24 TAPE DECK 2

25 INTERACTIVE SOUND STUDIO

DIGITAL SOUND CONTROL (DSC)
- to select the desired sound effect : OPTIMAL, TECHNO, ROCK, CLASSIC, VOCAL or JAZZ

PERSONAL
- to select or set personal equalizer setting

SURF
- to switch on or off the SURF feature.

STROBE
- to switch on or off the STROBE feature.

PAN
- to switch on or off the PAN feature.

HOLD
- to switch on or off the HOLD feature during CD playback only.

VEC
- to select the desired sound effect : HALL, DISCO, CONCERT, CLUB, CINEMA or ARCADE.

DYNAMIC BASS BOOST (DBB)
- to select a bass boost level or to switch off bass boost.

26 TAPE DECK 1

27 OPEN
- to open tape deck 1.

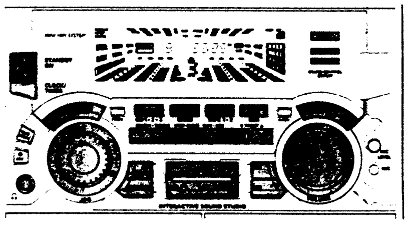
28 REPEAT
- to repeat a CD track, a disc, or all the available discs.

29 SHUFFLE
- to play all the available discs and their tracks in random order.

30 SLEEP TIMER
- to switch the system to standby mode at a selected time period.

31 ⏻
- to switch the system to standby mode.

Notes for remote control:
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).***
- ***Then select the desired function (▶, I◀, ▶I, etc.).***



Important:
Before you operate the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

Notes:
- *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
- *When the system is switched to standby mode, the demonstration will resume 5 seconds later.*

To stop the demonstration mode
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in demonstration mode.
  - → The demonstration will stop.
  - → "DEMO OFF" is displayed.
  - → The system will switch to standby mode.

Note:
- *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

To start the demonstration mode
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in standby mode.
  - → The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations automatically.

1 Press and hold **STANDBY ON** *(on the system only)* for ***5 seconds*** when the system is in standby or demonstration mode.
  - → "EASY SET" will be displayed and followed by "TUNER" and then "AUTO".
  - → EASY SET will start searching for all radio on FM band and then followed by radio stations on MW band.
  - → All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

Notes

- *EASY SET will start with the FM band. If there are still presets available, the system will continue to store the MW band.*
- *When EASY SET is used, all previously stored radio stations will be replaced.*
- *The last preset radio station will appear on the display when EASY SET is completed.*

Switching the system ON

- Press **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again or ⏻ on the remote control.
  - → The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  - → The display indicates the selected source.

Note

- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX/CDR IN terminals.*

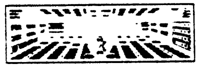
Selecting the Equalizer

Display

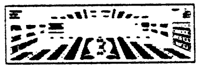
You can select the desired equalizer display for the system. You must not press the DSC button on the system before using the JOG.

- Rotate the **JOG** to select the desired Equalizer Display: PEAK HOLD, MIDDLE OUT, TOP DOWN, NORMAL or NITE MODE.
  - → The selected display will be shown.

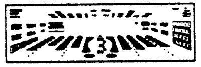
PEAK HOLD Display



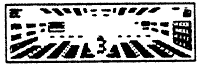
MIDDLE OUT Display



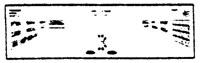
TOP DOWN Display



NORMAL Display



NITE MODE Display



Note

- *In NITE MODE, all lights will be switched off and the display brightness will be dimmed.*

Sound Control

VOLUME ADJUSTMENT

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

AUTO DIGITAL SOUND CONTROL (DSC)

- Press and hold **DIGITAL SOUND CONTROL (DSC)** for about 5 seconds.
  - → The current music is sampled and it automatically select the most suitable DSC setting.

DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to adjust the system to suit your type of music.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, TECHNO, ROCK, CLASSIC, VOCAL or JAZZ.
  - → The selected digital sound is encircled.
  - → "OPTIMAL X, TECHNO X, ROCK X, CLASSIC, VOCAL X or JAZZ X" will be displayed. "X" is the pre-selected level.
  - → VEC will be switched off.

You can change the digital sound setting level for all except CLASSIC with the JOG.

- First select the DSC feature, then rotate the **JOG** until the desired digital sound setting level is reached.
  - → The digital sound setting level will increase or decrease between level 1 and 5.

Note:

- *For neutral setting, select CLASSIC and switch off DBB.*

VIRTUAL ENVIRONMENT CONTROL (VEC)

The VEC feature enables you to adjust the system to select a type of environment.

- Press **VEC** to select HALL, DISCO, CONCERT, CLUB, CINEMA or ARCADE.
  - → The selected environment is encircled.
  - → "HALL X, DISCO X, CONCERT, CLUB X, CINEMA X or ARCADE X" will be displayed. "X" is the pre-selected level.

You can change the environment setting level for all except CONCERT with the JOG.

- First select the VEC feature, then rotate the **JOG** until the desired environment is reached.
  - → The level will increase or decrease between level 1 and 5.

AUTO SOUND CALIBRATION (ASC)

Whenever a new DSC or VEC feature is selected. The ASC will automatically calibrate the new sound inorder to give a smooth transition.

1 Press **DSC** or **VEC**.
  - → The selected digital sound is encircled.

2 Press **MORE** to switch the calibration ON or OFF.

3 Press **ENTER** to confirm the selection.
  - → "CALIBRATION ON" or "CALIBRATION OFF" will be displayed.

MAX SOUND

The MAX SOUND feature enables you to unleash a maximum sound effect combining the volume and DBB effect.

- Press **MAX SOUND** to switch on or off.
  - → "MAX SOUND" or "OFF" will be displayed.

PERSONAL SOUND

You can store upto 6 personal settings.

- Press **PERSONAL** to select USER 1, USER 2, USER 3, USER 4, USER 5 or USER 6.
  - → "USER 1, USER 2, USER 3, USER 4, USER 5 or USER 6" will be displayed.

Personal Setting

You can adjust the personal setting to your desired level with the JOG.

1 Press and hold **PERSONAL** for about 5 seconds.
  - → The personal setting mode is switched on.
  - → "60 HZ" will be displayed.

2 Rotate the **JOG** until the desired equalizer band level.
  - → The equalizer band level will be displayed.

3 Press **MORE** to select the next equalizer band.

60 HZ → 250 HZ →
1 KHZ → 4 KHZ →
16 KHZ → 60 HZ

- Repeat *2* and *3* until all equalizer bands are set.

4 Press **ENTER** to confirm the personal setting.
  - → "STORE UX" will be displayed. "X" is the next available personal setting.

- Press **MORE** to select the desired store location.

5 Press **ENTER** to confirm the store location.

- ***Repeat 1 – 5 to adjust the other personal settings.***

Rotate the JOG to adjust the speed of the effect after selecting SURF, STROBE, PAN or HOLD.

SURF

This feature allows you to simulate the sound effect like an ocean wave as though the music is surfing on top of the waves.

- Press **SURF**.
  - → "SURF XX" will be displayed.

STROBE

This feature allows you to simulate a stroboscopic sound effect as though the music appears and disappears.

- Press **STROBE**.
  - → "STRB XX" will be displayed.

PAN

This feature allows you to simulate a panoramic sound effect as though the music is circling through the room.

- Press **PAN**.
  - → "PAN XX" will be displayed.

HOLD

This feature allows you to simulate the sound effect like scratching a vinyl LP record and is only applicable during CD play mode.

- Press **HOLD**.
  - → "HOLD XX" will be displayed.

Notes:

- *"XX" is the speed of the effect.*
- *All other sound effects will be switched off when SURF, STROBE, PAN or HOLD is selected.*

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

- Press **DBB** briefly to select a bass boost level.
  - → The respective DBB level is being encircled and lit.
  - → "BEAT, PUNCH or BLAST" will be displayed.

To switch off DBB

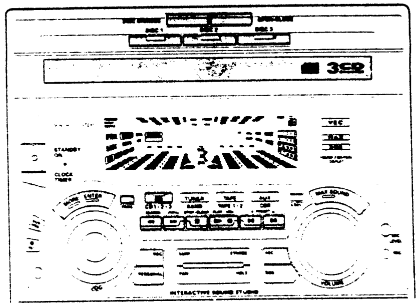
- Press **DBB** briefly until "DBB OFF" is displayed.

Note:

- *Some CDs or tapes might be recorded in high modulation. It may cause distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

Automatic DSC-DBB selection

The best DBB setting is generated automatically for each DSC selection. You can manually select the DBB setting that best suits your listening environment.



Warning!

1) This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.

2) Do not load more than one disc into each tray.

3) When the CD changer is loaded with CDs, do not turn over or shake the system. This may jam the changer.

You may load three discs in the CD changer for continuous playback without interruption.

Disc for playback

This system can playback all audio CD, finalized audio CD-Recordable and finalized audio CD-Rewritable format discs.

Loading the CD Changer

1 Press **CD** to select CD mode.

2 Press **OPEN•CLOSE**.
  - → The CD carousel slides out.

3 Load a CD with the printed side up in the right tray.

- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  - → The CD carousel will rotate until the empty tray is ready for loading.

4 Press **OPEN•CLOSE** to close the CD carousel.
  - → The total number of tracks and the playing time of the last selected disc appear on the display.

Note:

- *To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.*

CD Direct Play

You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.

- A lit button indicates that a disc is loaded in the disc tray.

Playing a CD

1 Press ▶ to start playback.
  - → The disc tray, track number and elapsed playing time of the current track appear on the display.

- To interrupt playback, press ❚❚.
  - → The playing time flashes.
- To resume playback, press ▶ again.

2 To stop playback, press ■.

Note:

- *All the available discs will play once, then stop.*

Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

1 Press **DISC CHANGE**.
  - → The CD carousel slides out.

2 Replace the discs in the left and right disc trays.

- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  - → The CD carousel will rotate until the inner tray is rotated out and is ready for loading.

3 Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track when playback is stopped

1 Press ⏮ or ⏭ until the desired track appears on the display.

2 Press ▶ to start playback.
  - → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

- Press ⏮ or ⏭ until the desired track appears on the display.
  - → The selected track number and elapsed playing time appear on the display.
- If you press ⏮ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  - → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible when playback is stopped. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "FULL".

1 Load the desired discs in the disc trays.

2 Press **PROGRAM** to start programming.
  - → The [illegible] flag starts flashing.
  - → It will cancel any previously selected repeat mode.

3 Press the **CD** (CD 1•2•3) button to select the disc.

4 Press ⏮ or ⏭ to select the desired track.

5 Press **PROGRAM** to store the track.

- Repeat steps *3* to *5* to store other discs and tracks.

6 Press ■ once to end programming.
  - → The total number of tracks programmed and total playing time appear on the display.

Notes:

- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - - -" appears on the display instead of the total playing time.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Reviewing the program

Reviewing of the program is possible only when playback is stopped.

- Press ⏮ or ⏭ repeatedly to review the programmed tracks.
- Press ■ to exit review mode.

Playing the program

1 Press ▶ to start program playback.
  - → "PLAY PROGRAM" appears on the display.
  - → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track or all programmed tracks will be played repeatedly.
  - → The REPEAT and PROGRAM flags will be displayed.

2 Press ■ to stop program playback.

Notes:
- *If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*
- *REPEAT DISC mode will be cancelled when program playback begins.*

Erasing the program *(when playback is stopped)*

- Press ■
  - → "PROGRAM CLEARED" will be displayed.

Note
- *The program will be erased when the system is disconnected from the power supply or when the CD carousel is opened. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "TRACKS CLEARED".*

Shuffle *(only on remote control)*

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**
  - → "SHUFFLE" will be displayed.
  - → The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will be played in random order until you press ■.
- If you press **REPEAT** during shuffling, the current track or all available discs will be played repeatedly.
  - → "TRACK" or "ALL" will be displayed.
  - → The REPEAT and SHUFFLE flags will be displayed.

2 Press **SHUFFLE** again to resume normal playback.
  - → The SHUFFLE flag disappears from the display.

Note:
- *REPEAT DISC mode will be cancelled when shuffle is selected.*

Repeat *(only on remote control)*

You can play the current track, a disc or all available discs repeatedly.

1 Press **REPEAT** on the remote control during CD playback to select the various repeat modes.
  - → "TRACK", "DISC", "ALL" or "OFF" will be displayed.
  - → The REPEAT flag appears on the display.
- The selected track, selected disc or all available discs will now be played repeatedly until you press ■.

2 Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
  - → The REPEAT flag disappears from the display.

Notes
- *REPEAT DISC mode is not available during program play or shuffling mode.*
- *You can also repeat shuffling a program.*
  - *→ "REPEAT TRACK" or "REPEAT PROGRAM" will be displayed.*
  - *→ The REPEAT, PROGRAM and SHUFFLE flags appear on the display.*

Changing the MW tuning grid

(not available for version /30)

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step presetted in the factory is 9 kHz.

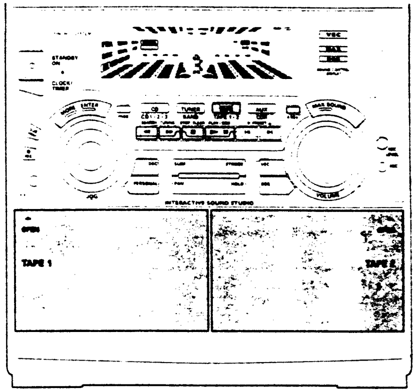
For MW band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

1 Disconnect the system from the AC power supply *(pull out the AC power cord)*.

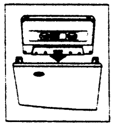
2 Press **TUNER** and **ENTER** depressed while reconnecting the system to the AC power supply.
  - → Display will show "GRID 9" or "GRID 10".

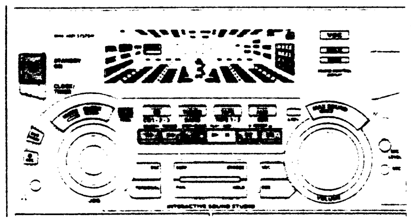
Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset radio stations will also be erased.*



Loading a tape

- Press **OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.





Note:
- *For 'EASY SET' feature, please refer to page 11.*

Tuning to radio stations

1 Press **TUNER** (BAND) to select TUNER mode.
  - → "TUNER" will be displayed. A few seconds later, the current radio frequency will be displayed.

2 Press **TUNER** (BAND) again to select the desired waveband: FM or MW.

3 Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
  - → The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak radio station, briefly press **TUNING** ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER** (BAND).

2 Press **PROGRAM** for more than one second.
  - → The PROGRAM flag starts flashing and "AUTO" will be displayed.
  - → The system will search for every available station in the FM waveband first, then search the MW wavebands.
  - → All available radio stations will be stored automatically. The frequency and preset number will be displayed briefly.
  - → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
  - → The system will remain tuned to the last stored preset radio station.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER** (BAND).

2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.

3 Press **PROGRAM** for less than one second.
  - → The PROGRAM flag starts flashing.
  - → The next available preset number will be displayed for selection.

4 Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.
- If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.

5 Press **PROGRAM** again.
  - → The PROGRAM flag disappears and the radio station will be stored.
- Repeat the **steps 3 to 5** to store other preset radio stations.

Notes:
- *When 40 radio stations are stored and you attempt to store another radio station, the display will show "FULL". If you want to change an existing preset number, repeat steps 3 and 5.*
- *You can cancel manual programming by pressing ■ (on the system only).*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET** ▼ or ▲ to select the desired preset number.
  - → The preset number, radio frequency, and waveband appear on the display.

Tape Playback

1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
  - → "TAPE 1" or "TAPE 2" will be displayed.
- Press **TAPE** (TAPE 1•2) again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.

3 Press ▶ to start playback.

3a *(For Tape Deck 2 only)*
Press ▶ (PLAY•SIDE) again to switch playback between side A and B.
  - → The BACK or FRONT flag appears on the display, depending on the side selected.

3b *(For Tape Deck 2 only)*
Press **A. REV** to select the different type of playback mode *(see auto reverse playback)*.

4 Press ■ to end playback.

Notes:
- *To change side before playback begins, use the SIDE button on the remote control.*

Auto Reverse Playback *(only on tape deck 2)*

- Press **A. REV** to select the different playback modes.

⇄ .... to record or playback on one side of the tape. The tape stops at the end of one side.

⊃ ...... to record or playback on both sides of the tape. The tape then stops.

⊂⊃ ... to playback continuously on both sides of the tape up to a maximum of 10 times per side unless you press ■.

Rewind/Fast Forward *(only on tape deck 2)*

When playback is stopped

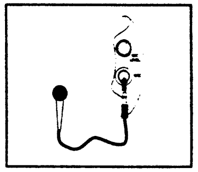
1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
  - → "<<<" or ">>>" will be displayed depending on which button is pressed.
  - → The tape will stop automatically at the end of the rewinding or fast forwarding.

2 Press ■ to stop rewinding or fast forwarding.

During playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  - → During searching, the sound is reduced to a low volume.
  - → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
- *During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. CD, TUNER, or AUX).*
- *Before use, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).*



Microphone Mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.

2 Connect a microphone to the **MIC** socket.

3 Press **CD**, **TUNER**, **TAPE** or **AUX**.

4 Play the selected source.

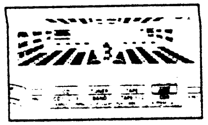
5 Adjust the volume level with **VOLUME** control.

6 Adjust the **MIC LEVEL** control to the mixing level that you want.

7 Start singing or talking through the microphone.

Note:
- *Keep the mic away from the speakers to prevent howling.*

AUX/CDR



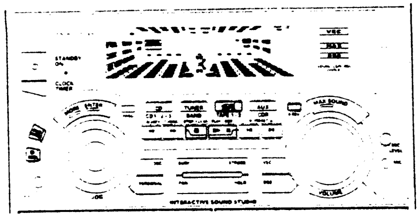
Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player, or CD Recorder) to the AUX/CD-R IN terminals you can hear the enhanced sound from the system.

- Press **AUX** to select the CDR mode.
  → "CDR" will be displayed
- Press **AUX** again to select external mode
  → "AUX" will be displayed.

Notes
- *There are two AUX modes:*
  - *i. the normal AUX mode.*
  - *ii. the CDR mode: where the LINE OUT of this mini system is muted. You will not be able to record or listen to the sound from the LINE OUT.*
- *You are advised not to listen to and record from the same source simultaneously*
- *All the sound control features (e.g. DSC, VEC, DBB, etc.) are available for selection.*

RECORDING



Notes
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (CrO$_2$)*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for 6 to 7 seconds.*
- *The recording level is set automatically, regardless of the position of Volume, DBB, VEC or DSC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO$_2$ tape detection hole when covering the tab opening.*

Recording from other sources *(only on tape deck 2)*

1 Press **TAPE** (TAPE 1•2) to select tape deck 2.
2 Load a blank tape into tape deck 2 with the open side downward.
3 Press **SIDE** on remote control to select the recording side.
  → The BACK or FRONT flag will be displayed, depending on the side selected.
4 Press **A. REV** to select the playback mode (⊏ or ⊐).
5 Press **CD**, **TUNER**, **TAPE 1** or **AUX**.
- Start playback of the selected source.
6 Press **REC** to start recording.
  → The REC flag starts flashing.
7 Press ■ to stop recording.

Notes:
- *Only ⊏ or ⊐ mode is available during recording.*
- *During recording, it is not possible to listen to another source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1 Press **TAPE** (TAPE 1•2) to select tape deck 2
2 Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2
  → Make sure the tape in tape deck 1 has its full spool to the left.
3 *(For Tape Deck 2 only)*
  Press **SIDE** on the remote control to select the recording side.
4 Press **DUB (HSD)** *once* for normal speed dubbing or *twice (within 2 seconds)* for high speed dubbing.
  → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed, followed by "DUBBING".
  → The HSD flag appears on the display during high speed dubbing.
- Dubbing will start immediately.
  → The REC flag starts flashing.
5 Press ■ to stop dubbing.

Notes:
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
- *You can listen to another source while dubbing.*

CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into a disc tray.
2 Press **CD** to select CD mode.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If you do not, the tracks are recorded according to the order on the selected disc.
3 Press **REC** to start recording.
  → The REC flag starts flashing.
- CD will start playback automatically.
4 Press ■ to stop recording.

Recording the mixed sound / One Touch Recording

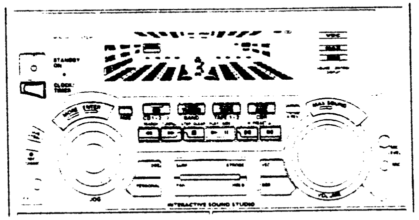
- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
- For One Touch Recording, as soon as you press **REC**, the current source (CD, TUNER or AUX) will be recorded on tape deck 2

1 Load a blank tape in tape deck 2.
2 Press **REC** to start recording.
  → The REC flag starts flashing.
3 Press ■ to stop recording.

Note:
- *When you press RECORD while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.*

Digital Recording via Digital Out

For CD digital recording, please refer to the Instructions Manual of the CD Recorder, digital audio equipment, etc.



Viewing the Clock

You can view the clock (if it is set) while the system is in standby mode or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK/TIMER** briefly *(on the system only)*.
  → " 10:38" (the current time) will be displayed.
  → "- - - - -" will be displayed if the clock is not set.

Setting the Clock

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK/TIMER** to select clock mode.
  → "00:00" or the current time starts flashing.
2 Set the hour with ◀◀ or ▶▶
3 Set the minute with ⏮ or ⏭.
4 Press **CLOCK/TIMER** again to store the setting
  → The clock starts.

- To exit without storing the setting, press ■ on the system.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*

Setting the Timer

- The system can switch on to CD, TUNER, or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will start to increase from the minimum level until the volume level before the set is switched to standby mode.**

1 Press and hold **CLOCK/TIMER** for more than 2 seconds to select timer mode
  → "00:00" or the last set timer starts flashing. The TIMER flag flashes
  → The last selected source is lit while other available sources are flashing.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
- Before selecting CD or TAPE, make sure a CD or tape is loaded in the CD tray or tape deck 2.
3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press ⏮ or ⏭ to set the minute for the timer to start.
5 Press **CLOCK/TIMER** to store the start time.
  → The timer is now set.
  → The TIMER flag remains on the display.
- At the preset time, the timer will be activated.
  → The selected source will be played.

Notes:
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
- *If the source selected is TAPE, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*

To switch off the TIMER
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press ■ on the system to cancel the timer.
  → The timer is now switched off.
  → The display will show "OFF" and the TIMER flag disappears.

To start the TIMER again *(for the same preset time and source)*
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press **CLOCK/TIMER** again to store the start time.
  → The timer is now switched on.
  → The TIMER flag appears on the display.

Sleep Timer *(only on remote control)*

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

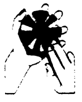
- Press **SLEEP TIMER** on the remote control repeatedly to select a period of time.
  → The selections are as follows (time in minutes):
  60 → 45 → 30 → 15 → OFF → 60 ...
  → "SLEEP XX" or "OFF" will be displayed. "XX" is the time in minutes.
- When you reach the desired length of time, stop pressing the **SLEEP TIMER** button.
  → After this amount of time passes, the system will switch to the standby mode.

To switch off the sleep timer
- Press **SLEEP TIMER** repeatedly until "OFF" is displayed, or press the **STANDBY•ON** button.

Maintenance

Cleaning the Cabinet
- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens
- After prolonged use, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

Cleaning the Heads and the Tape Paths
- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape once.

Demagnetizing the heads
- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances you should try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.

- If a fault occurs, check the points listed below before taking the system for repair
- Should any problems persist after you have made these checks, consult your nearest dealer or service center

CD Player Operation

"NO DISC" is displayed.
- The disc is inserted upside down
- → *Place CD with printed side up*
- *Moisture condensation at the lens*
- → *Wait until lens has adjusted to normal room temperature*
- There is no disc in the CD tray
- → *Insert a CD*
- The CD is dirty, badly scratched or warped.
- → *Clean or replace the CD*
- The CD lens is dirty or dusty
- → *See section under Maintenance.*

"DISC NOT FINALISED" is displayed.
- The CD-RW or CD-R disc is not properly recorded for the use of a standard CD player.
- → *Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.*
- The CD is badly scratched or dirty
- → *Replace or clean CD.*

Radio Reception

Poor radio reception
- The signal is too weak
- → *Adjust the antenna*
- → *Connect an external antenna for better reception*
- The TV or VCR is too close to the stereo system
- → *Separate the stereo system from the TV or VCR*

Cannot tune to station.
- Wrong tuning grid
- → *Switch to the correct tuning grid*

Tape Deck Operation

Recording or playback cannot be made or there is a decrease in audio level.
- *Dirty tape heads, capstans or pressure rollers*
- → *See section on tape deck maintenance*
- Magnetic build-up in the record/playback head
- → *Use demagnetizing tape.*

General

System does not react when any button is pressed.
- Electrostatic discharge.
- → *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.*

No or poor sound.
- Volume is not turned up.
- → *Adjust VOLUME*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly*
- → *Make sure the stripped speaker wire is clamped*

Reversed left and right sound.
- Speakers are connected wrongly.
- → *Check the speaker connections and location*

Lack of bass sound or apparently imprecise physical location of musical instruments.
- Speakers are connected wrongly.
- → *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.
- Wrong source is selected.
- → *Select the source (CD, TUNER, etc.) before pressing the function button, (▶, ⏮, ⏭, etc.).*
- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated.*
- Batteries are exhausted.
- → *Replace the batteries.*

Timer not working.
- Clock is not set.
- → *Set the clock*
- Timer is not switched on.
- → *Press CLOCK/TIMER to switch on the timer*
- Dubbing/recording is in progress
- → *Stop dubbing/recording.*

Clock setting is erased.
- There was a power failure
- → *Reset the clock.*

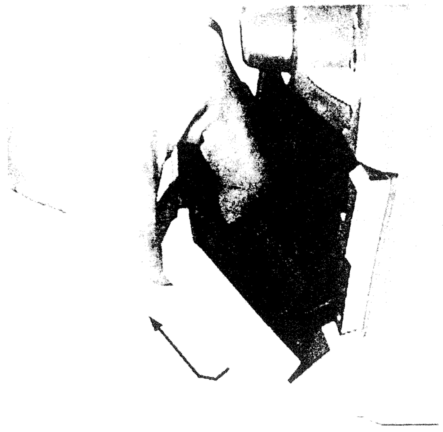
System displays features automatically; buttons flash continuously.
- Demonstration mode is switched on.
- → *Press and hold ■ (on the system only) for 5 seconds to switch off the demonstration.*

A howling sound at external source.
- You hear feedback when you are listening and recording from the same source simultaneously.
- → *Press AUX to select CDR mode.*

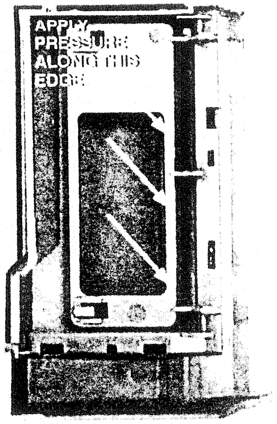
All lighted buttons are not lit.
- Equalizer Display is switched on in NITE mode.
- → *Rotate JOG to other Equalizer Display.*

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover



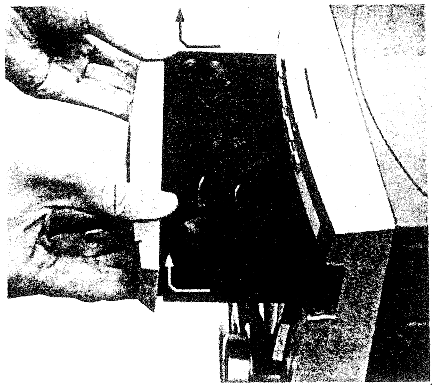
Remove Cassette Door



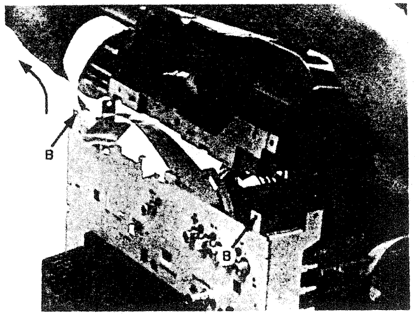
Cassette Door

Dismantling of the CDC Module and Front Panel

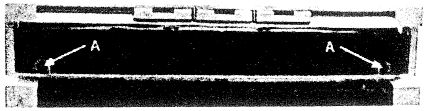
1) Loosen the 16 screws to remove the Cabinet Rear (pos 259) of the set :-
    - 5 screws each on the left side & right side of the Cabinet Rear.
    - 6 screws at the rear of the Cabinet Rear.
2) Slide out the CDC tray and remove the Cover CDC (pos 106) as indicated.
3) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
4) Remove 6 screws J as indicated to loosen the AF Board (pos 1101-B) and 1 screw Q as indicated to loosen the Bar Tuner (pos 263).
   (See Plate Rear and Power Module pictures)
5) Remove 1 screw (pos 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 236).



Remove Cover CDC



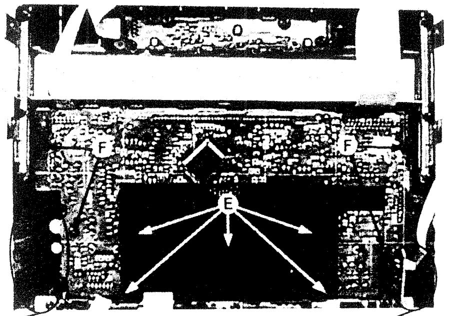
Remove CDC Module

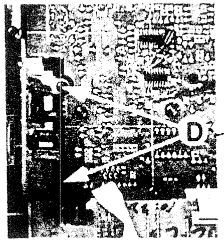


Front CDC

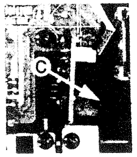
Dismantling of the Front Board

1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-A).
2) Remove 2 screws D as indicated to loosen the Karaoke Board (pos 1100-C) for set with karaoke.
3) Remove 5 screws E as indicated to loosen the Plate Front (pos 254).
4) Remove 4 screws F as indicated to loosen the Front Board (pos 1100-A).





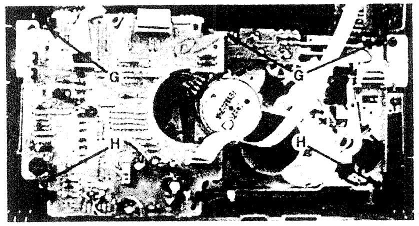
Remove Karaoke Board



Remove Headphone Board

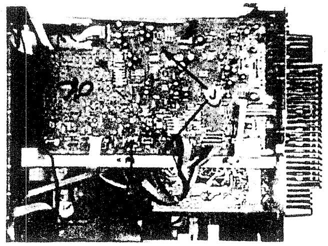
Dismantling of the ETF Module

1) Remove 6 screws (3 screws G and 3 screws H) as indicated to loosen the ETF6 Module (pos 1103).

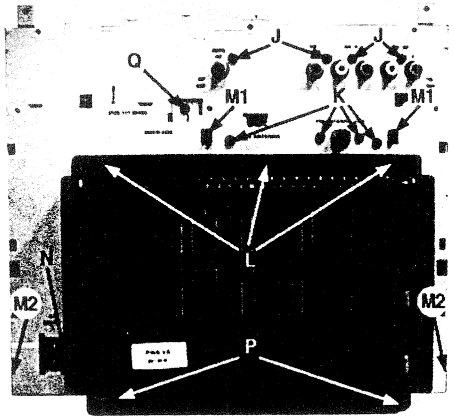


Dismantling of Plate Rear and Power Module

1) Remove 6 screws J as indicated to loosen the AF Board (pos 1101-B) and 1 screw Q as indicated to loosen the Bar Tuner (pos 263).
2) Remove 4 screws K and uncatch M1 as indicated to loosen the Tuner Board (pos 1102).
3) Remove 3 screws L and 1 screw N (if obstructed) and uncatch M2 as indicated to take out the Plate Rear(pos 234).
4) Remove 2 screws P as indicated to free the Power Module (pos 1105) from the Bottom Plate assembly.



Top View



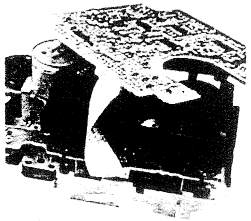
Repair Hints

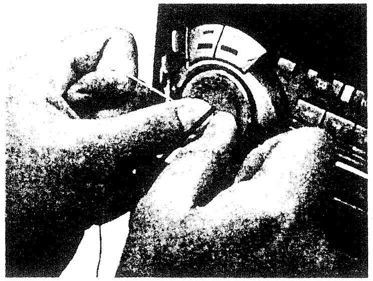
1) The Jog Rotary (pos 142) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 1.

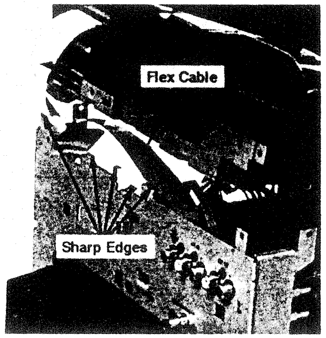
3) During re-assembly of the set, care should be taken to dress all the flex cable wires properly to prevent any damaged cause by any sharp metal edges or any other metal parts. See picture 2.

4) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 3.

5) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

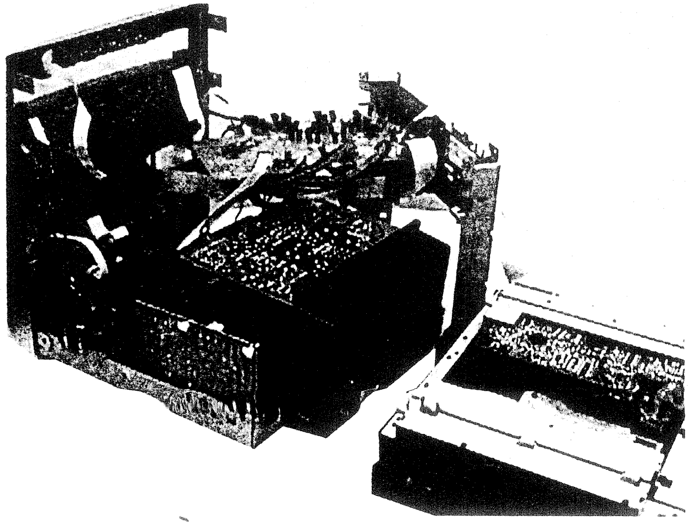

Picture 3


Picture 1

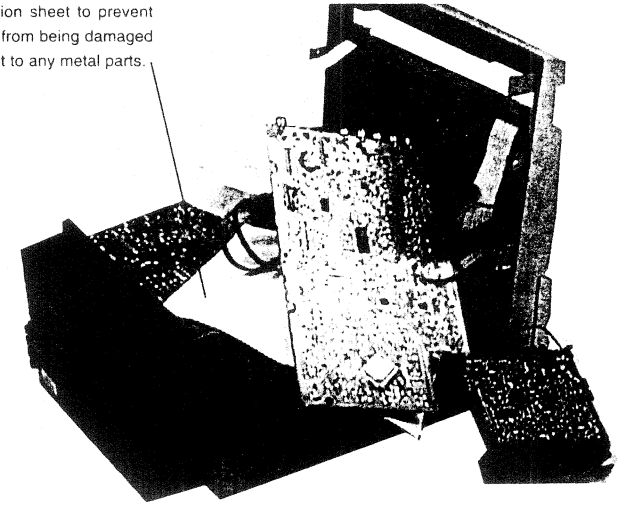


Picture 2

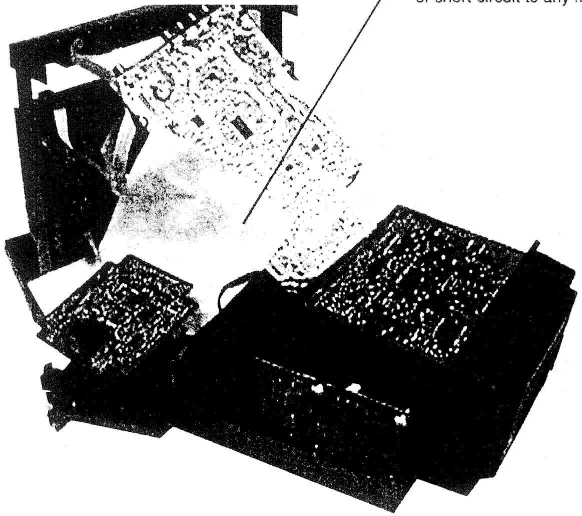
Service pos A



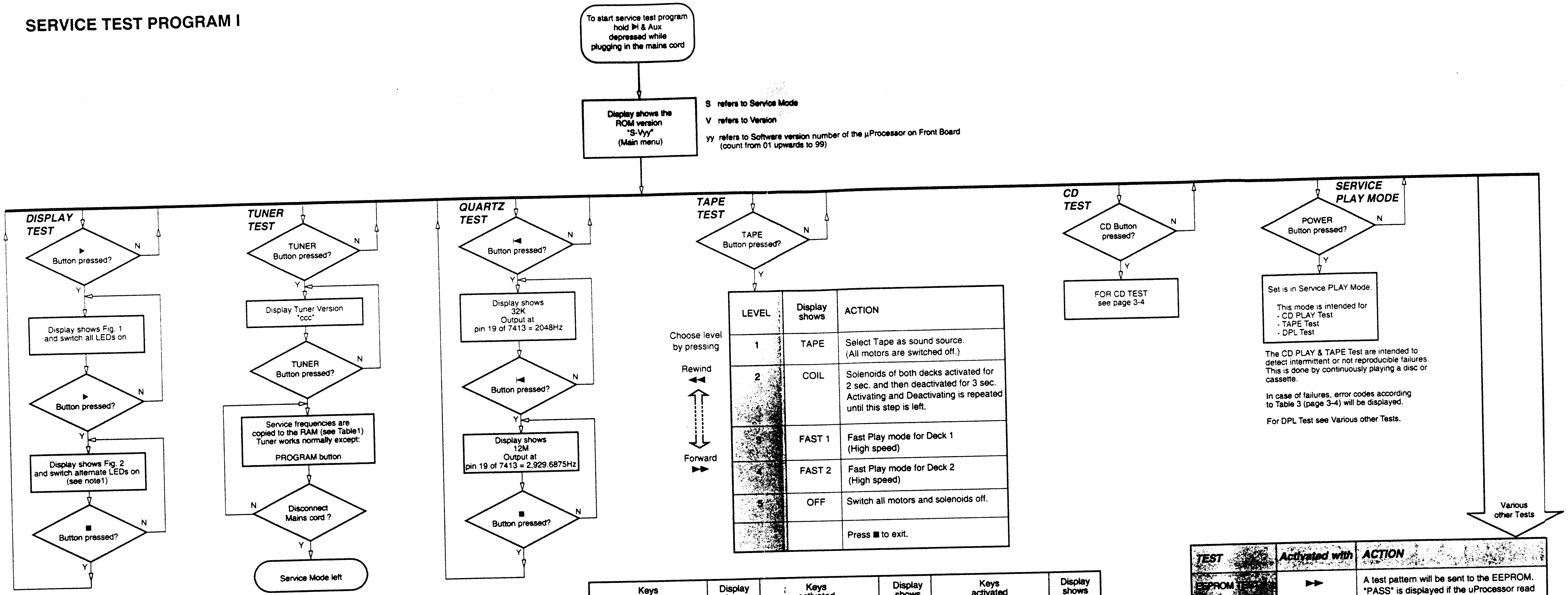
Service pos B


Use a insulation sheet to prevent the AF board from being damaged or short-circuit to any metal parts.

Service pos C


Use a insulation sheet to prevent the ETF board from being damaged or short-circuit to any metal parts.

SERVICE TEST PROGRAM I


To start service test program
hold ▶| & Aux
depressed while
plugging in the mains cord
Display shows the
ROM version
"S-Vyy"
(Main menu)
DISPLAY TEST
▶ Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
Display shows Fig. 2 and switch alternate LEDs on (see note1)
■ Button pressed?
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except:
PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
|◀ Button pressed?
Display shows 32K Output at pin 19 of 7413 = 2048Hz
|◀ Button pressed?
Display shows 12M Output at pin 19 of 7413 = 2,929.6875Hz
■ Button pressed?
TAPE TEST
TAPE Button pressed?
Choose level by pressing
Rewind ◀◀
Forward ▶▶
CD TEST
CD Button pressed?
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test
Various other Tests

S refers to Service Mode

V refers to Version

yy refers to Software version number of the µProcessor on Front Board (count from 01 upwards to 99)

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec. Activating and Deactivating is repeated until this step is left.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off.
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to Table 3 (page 3-4) will be displayed.

For DPL Test see Various other Tests.

PRESET	Europe "EUR"	East Europe Extended-band "EAS"	East Europe "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	531/530kHz
4	1602kHz	87.5MHz	1602kHz	1700kHz	1602/1700kHz
5	558kHz	531kHz	558kHz	560kHz	558/560kHz
6	1494kHz	1602kHz	1494kHz	1500kHz	1494/1500kHz
7	153kHz	558kHz	87.5MHz	98MHz	87.5MHz
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.81MHz	98MHz	87.5MHz	98MHz

Table 1

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	RECORD *	12	■ (Exit Test)	
Any Remote control key	RC	TAPE DUBBING *	13	▶II	26
DISC CHANGE	1	MORE	14	|◀	27
OPEN / CLOSE	2	ENTER	15	▶|	28
DISC 1	3	PROGRAM	16	DSC	29
DISC 2	4	CD	17	SURF	30
DISC 3	5	TUNER	18	STROBE	31
STANDBY ON	6	TAPE	19	VEC	32
CLOCK / TIMER	7	AUX	20	PERSONAL	33
DPL *	8	TAPE MODE *	21	PAN	34
DOLBY B *	9	MAX SOUND	22	HOLD	35
RDS *	10	◀◀	23	DBB	36
NEWS *	11	▶▶	24		

* Not for all type/version.

Table 2

TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!***
KEY TEST	▶| ■ to Exit	Key numbers according Table 2 are shown on the display.
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the cloc to normal. "NORMAL" displayed for 1 sec.
ADC TEST	AUX ■ to Exit	The display shows "ADC1_aaa". Press AUX again to shows "ADC2_bbb", "ADC3_ccc", "ADC4_ddd" and "ADC5_eee", where "aaa", "bbb", "ccc", "ddd" and "eee" is the ADC value between 0 - 255 representing NTC, SA_1, SA_2, SA_3 and SA_4 lines respectively. The set will go to standby when temperature is too high (NTC line ADC value is below 76)
VOLUME TEST	Rotary Volume Knob or Jog Shuttle	Display shows volume value for 2 seconds. Volume increases or decreases in steps of until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play Mode)	DPL	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be install in this te
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

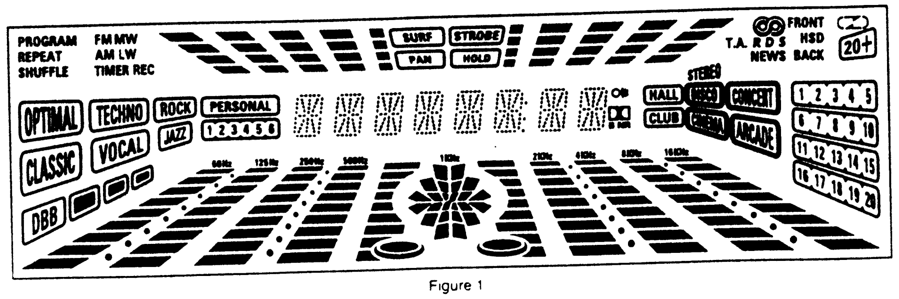
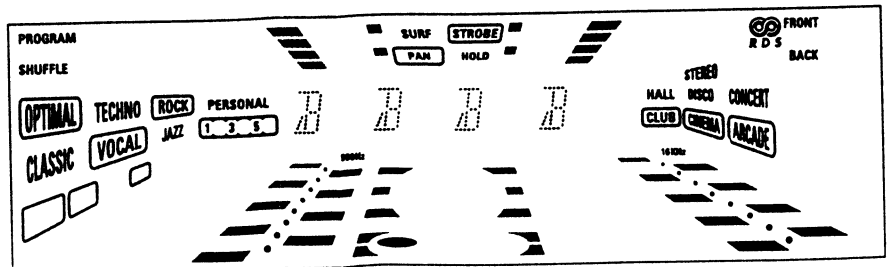

PROGRAM
REPEAT
SHUFFLE
FM MW
AM LW
TIMER REC
SURF
STROBE
PAN
HOLD
FRONT
T.A. R D S
HSD
NEWS
BACK
20+
STEREO
OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ
DBB
HALL
DISCO
CONCERT
CLUB
CINEMA
ARCADE

Figure 1


PROGRAM
SHUFFLE
SURF
STROBE
PAN
HOLD
FRONT
R D S
BACK
STEREO
HALL
DISCO
CONCERT
CLUB
CINEMA
ARCADE
OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ

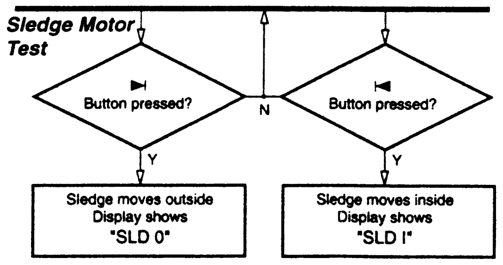
note1 : DISC 1, DISC 3, CD, TAPE, DPL Surround, DPL Centre, MAX SOUND, ENTER.

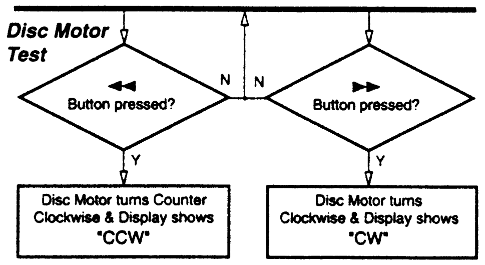
Figure 2

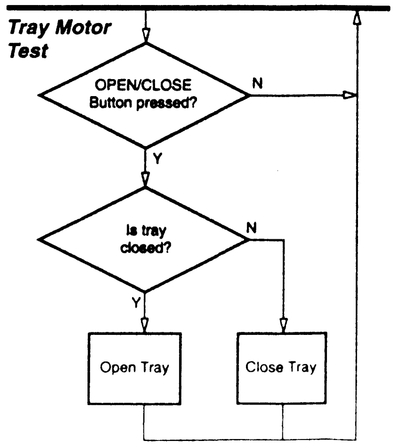
Error code	Type	Error Description
E1000	W	**Focus Error** **Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.**
E1001	W	**Radial Error** **Triggered when the radial servo is off-track for a certain time during play.**
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Disc motor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within a certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020*	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021*	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

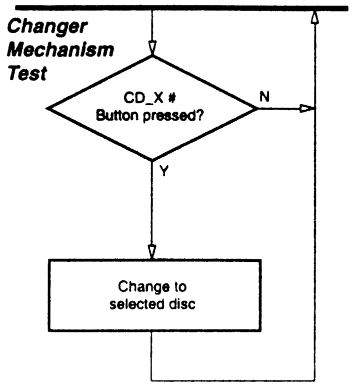
F = Fatal error & the set stop play function W = Warning
* For Logic set only.

Table 3


Sledge Motor Test
⏭ Button pressed?
⏮ Button pressed?
N
Y
Y
Sledge moves outside Display shows "SLD 0"
Sledge moves inside Display shows "SLD I"

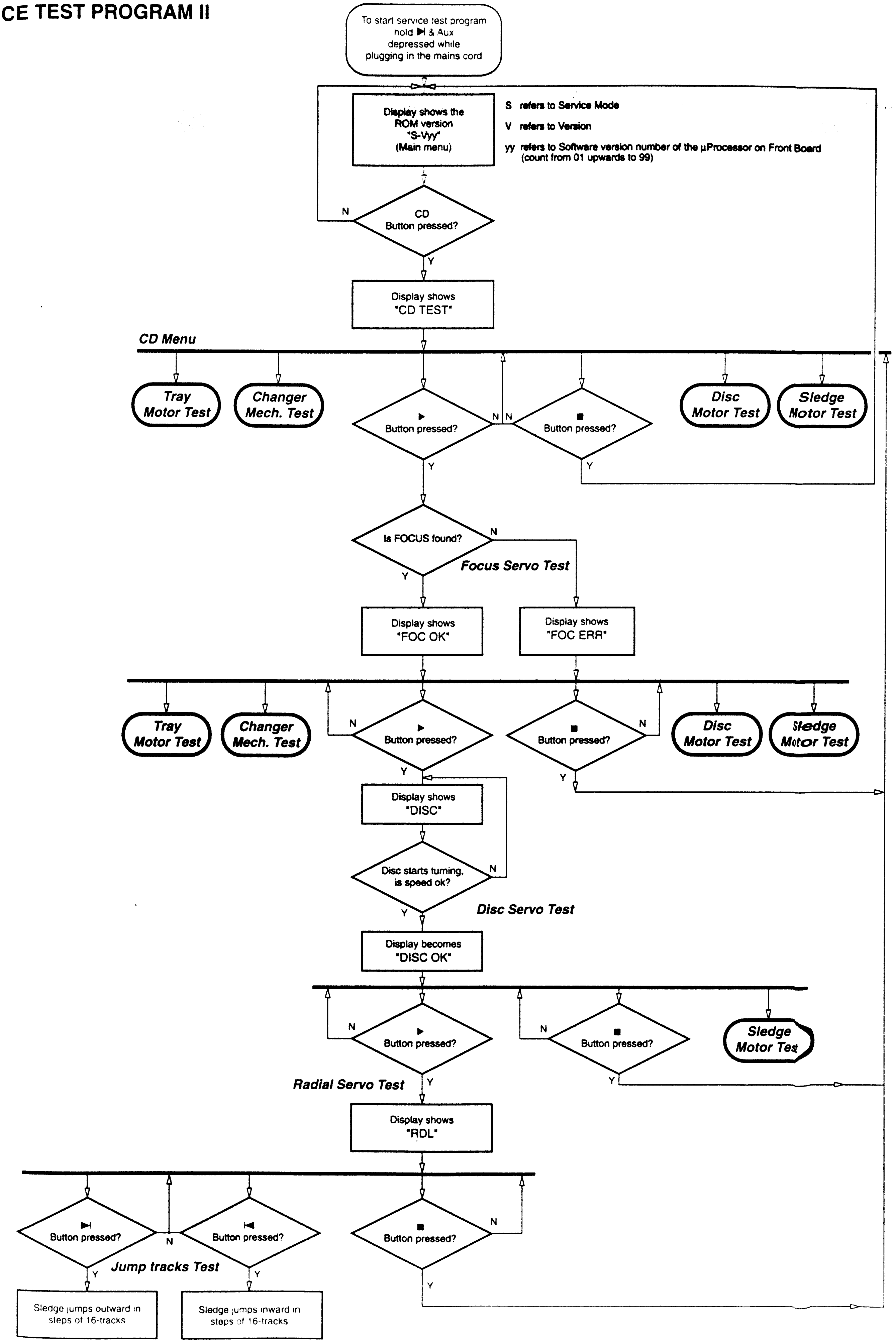

Disc Motor Test
◀◀ Button pressed?
▶▶ Button pressed?
N
N
Y
Y
Disc Motor turns Counter Clockwise & Display shows "CCW"
Disc Motor turns Clockwise & Display shows "CW"


Tray Motor Test
OPEN/CLOSE Button pressed?
N
Y
Is tray closed?
N
Y
Open Tray
Close Tray

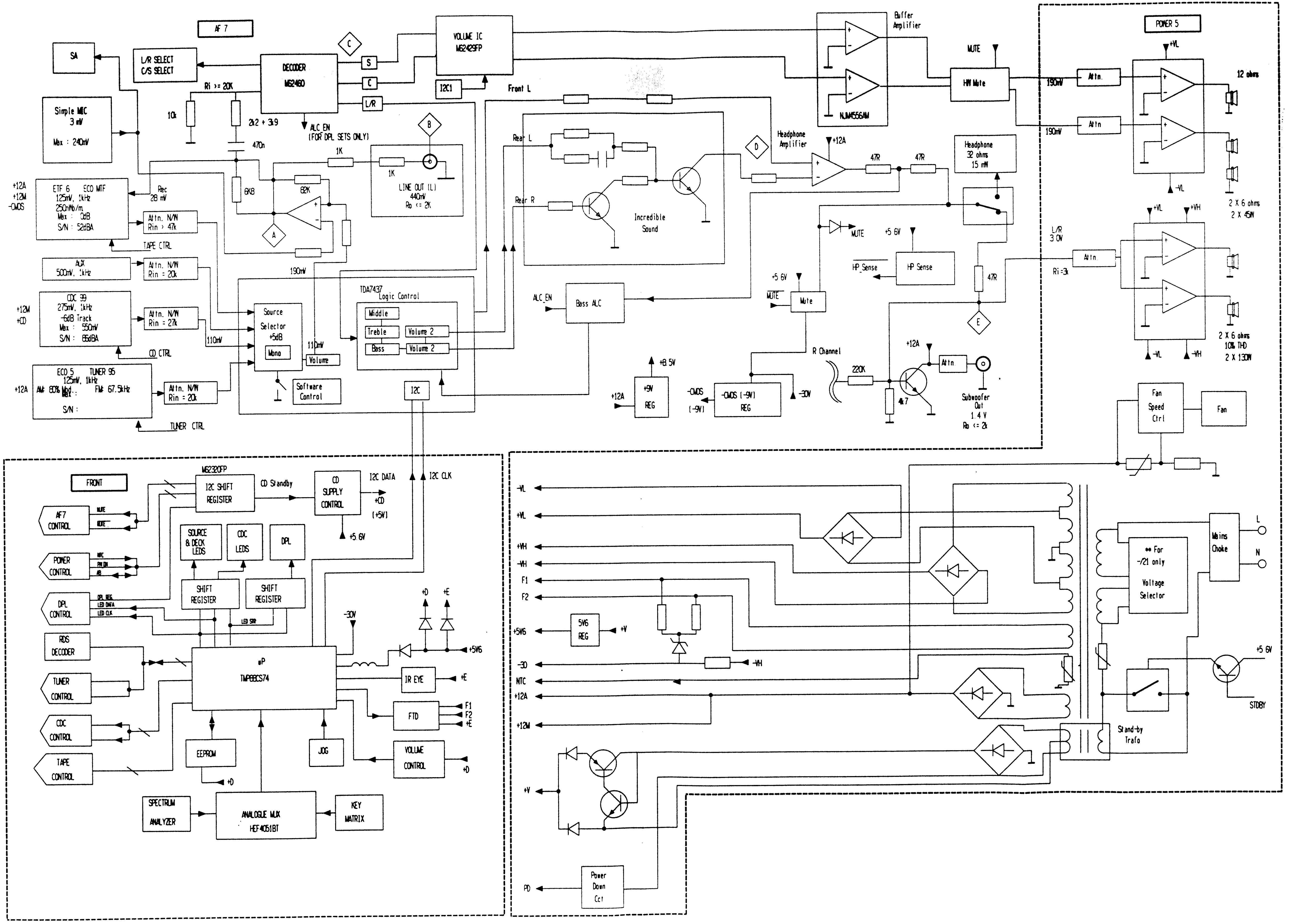

Changer Mechanism Test
CD_X # Button pressed?
N
Y
Change to selected disc

CD_X refers to CD1, CD2 or CD3

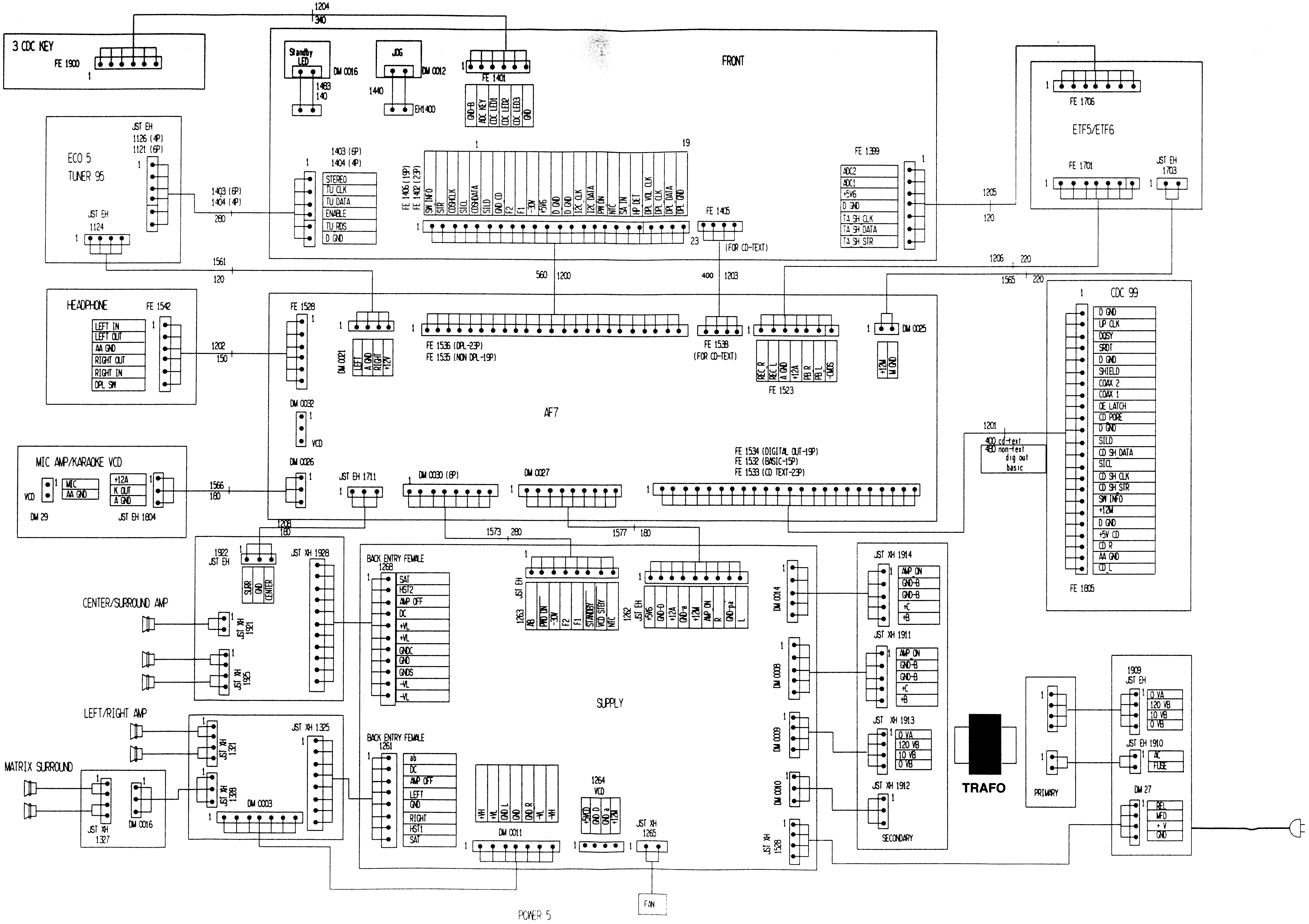
SERVICE TEST PROGRAM II


To start service test program hold ⏭ & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
S refers to Service Mode
V refers to Version
yy refers to Software version number of the µProcessor on Front Board (count from 01 upwards to 99)
CD Button pressed?
N
Y
Display shows "CD TEST"
CD Menu
Tray Motor Test
Changer Mech. Test
▶ Button pressed?
■ Button pressed?
N
N
Y
Y
Disc Motor Test
Sledge Motor Test
Is FOCUS found?
N
Y
Focus Servo Test
Display shows "FOC OK"
Display shows "FOC ERR"
Tray Motor Test
Changer Mech. Test
▶ Button pressed?
■ Button pressed?
N
N
Y
Y
Disc Motor Test
Sledge Motor Test
Display shows "DISC"
Disc starts turning, is speed ok?
N
Y
Disc Servo Test
Display becomes "DISC OK"
▶ Button pressed?
■ Button pressed?
N
N
Y
Y
Sledge Motor Test
Radial Servo Test
Display shows "RDL"
⏭ Button pressed?
⏮ Button pressed?
N
Y
Y
Jump tracks Test
■ Button pressed?
N
Y
Sledge jumps outward in steps of 16-tracks
Sledge jumps inward in steps of 16-tracks

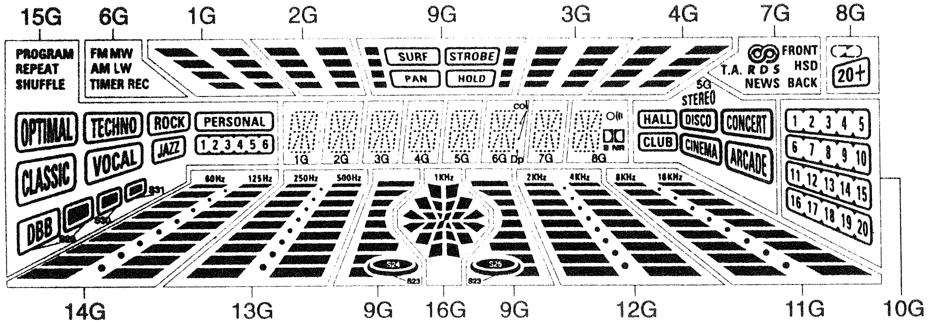
SET BLOCK DIAGRAM

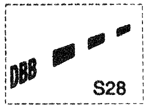

AF 7
SA
L/R SELECT
C/S SELECT
DECODER
M62460
C
S
C
L/R
VOLUME IC
M62429FP
I2C1
Front L
Ri >= 20K
10k
2k2 + 3k9
470n
ALC_EN
(FOR DPL SETS ONLY)
B
1K
1K
LINE OUT (L)
440mV
Ro <= 2K
Simple MIC
3 mV
Max : 240mV
+12A
+12M
-CMOS
ETF 6 ECO MTF
125mV, 1kHz
250nWb/m
Max : 0dB
S/N : 52dBA
Rec
28 mV
6K8
82K
A
Attn. N/W
Rin > 47k
TAPE CTRL
AUX
500mV, 1kHz
Attn. N/W
Rin = 20k
190mV
+12M
+CD
CDC 99
275mV, 1kHz
-6dB Track
Max : 550mV
S/N : 86dBA
Attn. N/W
Rin = 27k
110mV
CD CTRL
+12A
ECO 5 TUNER 95
125mV, 1kHz
AM: 80% Mod.
Max :
FM: 67.5kHz
S/N :
Attn. N/W
Rin = 20k
TUNER CTRL
Source
Selector
+5dB
Mono
110mV
Volume
Software
Control
TDA7437
Logic Control
Middle
Treble
Bass
Volume 2
Volume 2
I2C
Rear L
Rear R
Incredible
Sound
D
Headphone
Amplifier
+12A
47R
47R
Headphone
32 ohms
15 mW
Buffer
Amplifier
NJM4556AM
MUTE
HW Mute
190mV
190mV
MUTE
+5 6V
HP Sense
HP_Sense
ALC_EN
Bass ALC
+5 6V
MUTE
Mute
47R
E
R Channel
220K
4k7
+12A
Attn
Subwoofer
Out
1.4 V
Ro <= 2k
+8.5V
+12A
+9V
REG
-CMOS
(-9V)
-CMOS (-9V)
REG
-30V
POWER 5
+VL
Attn.
Attn
-VL
12 ohms
2 X 6 ohms
2 X 45W
+VL
+VH
L/R
3 0V
Ri =3k
Attn
-VL
-VH
2 X 6 ohms
10% THD
2 X 130W
Fan
Speed
Ctrl
Fan
FRONT
M62320FP
I2C SHIFT
REGISTER
CD Standby
CD
SUPPLY
CONTROL
+CD
(+5V)
+5.6V
I2C DATA
I2C CLK
AF7
CONTROL
MUTE
MUTE
POWER
CONTROL
NTC
PW DN
AB
DPL
CONTROL
DPL REG
LED DATA
LED CLK
SOURCE
& DECK
LEDS
CDC
LEDS
DPL
SHIFT
REGISTER
SHIFT
REGISTER
LED STR
-30V
+D
+E
+5V6
RDS
DECODER
TUNER
CONTROL
CDC
CONTROL
TAPE
CONTROL
µP
TMP88CS74
IR EYE
+E
FTD
F1
F2
+E
EEPROM
+D
JOG
VOLUME
CONTROL
+D
SPECTRUM
ANALYZER
ANALOGUE MUX
HEF4051BT
KEY
MATRIX
-VL
+VL
+VH
-VH
F1
F2
+5V6
5V6
REG
+V
-30
-VH
NTC
+12A
+12M
+V
PD
Power
Down
Cct
L
N
Mains
Choke
** For
-/21 only
Voltage
Selector
+5 6V
STDBY
Stand-by
Trafo

SET WIRING DIAGRAM

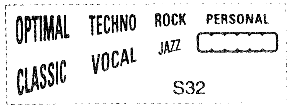

1204
340
3 CDC KEY
FE 1900
Standby LED
DM 0016
1483
140
JOG
DM 0012
1440
EH1400
FE 1401
GND-B
ADC KEY
CDC LED1
CDC LED2
CDC LED3
GND
FRONT
FE 1706
ETF5/ETF6
FE 1701
JST EH 1703
JST EH
1126 (4P)
1121 (6P)
ECO 5
TUNER 95
JST EH
1124
1403 (6P)
1404 (4P)
280
STEREO
TU CLK
TU DATA
ENABLE
TU RDS
D GND
FE 1406 (19P)
FE 1402 (23P)
SW INFO
STR
CDSHCLK
SICL
CDSHDATA
SILD
GND CD
F2
F1
-30V
+5V6
D GND
D GND
I2C CLK
I2C DATA
PW ON
NTC
SA IN
HP DET
DPL VOL CLK
DPL CLK
DPL DATA
DPL GND
19
23
FE 1405
(FOR CD-TEXT)
FE 1399
ADC2
ADC1
+5V6
D GND
TA SH CLK
TA SH DATA
TA SH STR
1205
120
1561
120
560
1200
400
1203
1206
220
1565
220
HEADPHONE
FE 1542
LEFT IN
LEFT OUT
AA GND
RIGHT OUT
RIGHT IN
DPL SW
1202
150
FE 1528
DM 0021
LEFT
A GND
RIGHT
+12V
FE 1536 (DPL-23P)
FE 1535 (NON DPL-19P)
FE 1538
(FOR CD-TEXT)
REC R
REC L
A GND
+12A
PB R
PB L
-CMOS
FE 1523
DM 0025
+12M
M GND
CDC 99
D GND
UP CLK
DOSY
SRDT
D GND
SHIELD
COAX 2
COAX 1
OE LATCH
CD PORE
D GND
SILD
CD SH DATA
SICL
CD SH CLK
CD SH STR
SW INFO
+12M
D GND
+5V CD
CD R
AA GND
CD L
FE 1805
AF7
DM 0032
VCD
DM 0026
1201
400 cd-text
480 non-text
dig out
basic
FE 1534 (DIGITAL OUT-19P)
FE 1532 (BASIC-15P)
FE 1533 (CD TEXT-23P)
MIC AMP/KARAOKE VCD
VCD
MIC
AA GND
+12A
K OUT
A GND
DM 29
JST EH 1804
1566
180
JST EH 1711
DM 0030 (8P)
DM 0027
1208
180
1573
280
1577
180
1922
JST EH
SUBR
GND
CENTER
JST XH 1928
CENTER/SURROUND AMP
JST XH 1921
JST XH 1925
BACK ENTRY FEMALE
1268
SAT
HST2
AMP OFF
DC
+VL
+VL
GNDC
GND
GNDS
-VL
-VL
JST EH
1263
AB
PROT IN
-30V
F2
F1
STANDBY
VCD STBY
NTC
JST EH
1262
+5V6
GND-D
+12A
GND-a
+12M
AMP ON
R
GND-pa
L
DM 0014
DM 0008
DM 0009
DM 0010
JST XH 1528
SUPPLY
JST XH 1914
AMP ON
GND-B
GND-B
+C
+B
JST XH 1911
AMP ON
GND-B
GND-B
+C
+B
JST XH 1913
0 VA
120 VB
10 VB
0 VB
JST XH 1912
SECONDARY
TRAFO
PRIMARY
1909
JST EH
0 VA
120 VB
10 VB
0 VB
JST EH 1910
AC
FUSE
DM 27
REL
MFD
+ V
GND
LEFT/RIGHT AMP
JST XH 1321
JST XH 1328
JST XH 1325
DM 0003
MATRIX SURROUND
JST XH
1327
DM 0016
BACK ENTRY FEMALE
1261
ab
DC
AMP OFF
LEFT
GND
RIGHT
HST1
SAT
+VH
+VL
GND L
GND
GND R
-VL
-VH
DM 0011
1264
VCD
+5VCD
GND D
GND a
+12M
JST XH
1265
FAN
POWER 5

FTD DISPLAY PIN CONNECTIONS

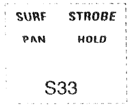

15G
6G
1G
2G
9G
3G
4G
7G
8G
PROGRAM
REPEAT
SHUFFLE
FM MW
AM LW
TIMER REC
SURF
STROBE
PAN
HOLD
FRONT
T.A. RDS HSD
NEWS BACK
20+
5G
STEREO
OPTIMAL
TECHNO
ROCK
PERSONAL
123456
CLASSIC
VOCAL
JAZZ
col
1G 2G 3G 4G 5G 6G Dp 7G 8G
B NR
HALL DISCO CONCERT
CLUB CINEMA ARCADE
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
60Hz 125Hz 250Hz 500Hz 1KHz 2KHz 4KHz 8KHz 16KHz
S31
S30
S29
DBB
S24
S23
S25
14G
13G
9G
16G
9G
12G
11G
10G



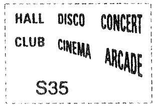
(15G)


OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ
S32

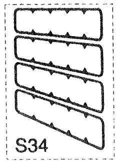
(15G)


SURF
STROBE
PAN
HOLD
S33

(9G)

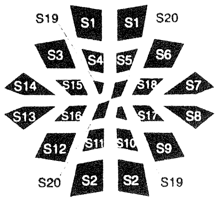

HALL
DISCO
CONCERT
CLUB
CINEMA
ARCADE
S35

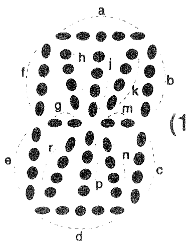
(5G)



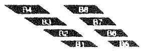
(10G)

(16G)

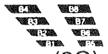

S19
S1
S1
S20
S3
S4
S5
S6
S14
S15
S18
S7
S13
S16
S17
S8
S12
S11
S10
S9
S20
S2
S2
S19


a
h
j
f
b
k
g
m
r
e
n
c
p
d

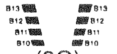
(1G-8G)


B4
B8
B3
B7
B2
B6
B1
B5

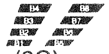
(1G)


B4
B8
B3
B7
B2
B6
B1
B5

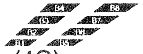
(2G)


B13
B12
B11
B10
B13
B12
B11
B10

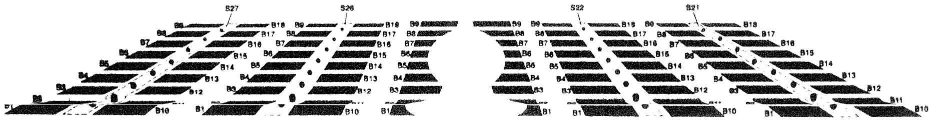
(9G)


B4
B8
B3
B7
B2
B6
B1
B5

(3G)


B4
B8
B3
B7
B2
B6
B1
B5

(4G)


S27
S26
S22
S21
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
B13
B14
B15
B16
B17
B18

(14G) (13G) (9G) (12G) (11G)

FTD DISPLAY PIN CONNECTIONS

	1G~4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	15G	16G
P1	a	a	a	a	a	B1	1	B1	B1	B1	B1	S32	S2
P2	h	h	h	h	h	S23	2	B2	B2	B2	B2	▭ PERSONAL	S12
P3	j . p	j . p	j . p	j . p	j . p	S24	3	B3	B3	B3	B3	▭ ROCK	S11
P4	k	k	k	k	k	S25	4	B4	B4	B4	B4	▭ TECHNO	S10
P5	b	b	b	b	b	B2	5	B5	B5	B5	B5	▭ OPTIMAL	S9
P6	f	f	f	f	f	B3	6	B6	B6	B6	B6	▭ CLASSIC	S13
P7	m	m	m	m	m	B4	7	B7	B7	B7	B7	▭ VOCAL	S16
P8	g	g	g	g	g	B5	8	B8	B8	B8	B8	▭ JAZZ	S20
P9	c	c	c	c	c	B6	9	B9	B9	B9	B9	1	S19
P10	e	e	e	e	e	B7	10	B10	B10	B10	B10	2	S17
P11	r	r	r	r	r	B8	11	B11	B11	B11	B11	3	S8
P12	n	n	n	n	n	B9	12	B12	B12	B12	B12	4	S14
P13	d	d	d	d	d	S33	13	B13	B13	B13	B13	5	S15
P14	B1	STEREO	col	NEWS	O((	B10	14	B14	B14	B14	B14	6	S18
P15	B5	S35	Dp	BACK	DD B NR	▭ (PAN)	15	B15	B15	B15	B15	SHUFFLE	S7
P16	B2	▭ (HALL)	TIMER	T.A.	(	▭ (HOLD)	16	B16	B16	B16	B16	REPEAT	S3
P17	B6	▭ (CLUB)	REC	RDS	⧗	B11	17	B17	B17	B17	B17	PROGRAM	S4
P18	B3	▭ (DISCO)	AM	HSD	)	▭ (SURF)	18	B18	B18	B18	B18	S28	S5
P19	B7	▭ (CINEMA)	LW	FRONT	20+	▭ (STROBE)	19	S21	S22	S26	S27	S29	S6
P20	B4	▭ (CONCERT)	FM	-	-	B12	20	8KHz	2KHz	250Hz	60Hz	S30	S1
P21	B8	▭ (ARCADE)	MW	-	-	B13	S34	16KHz	4KHz	500Hz	125Hz	S31	1KHz

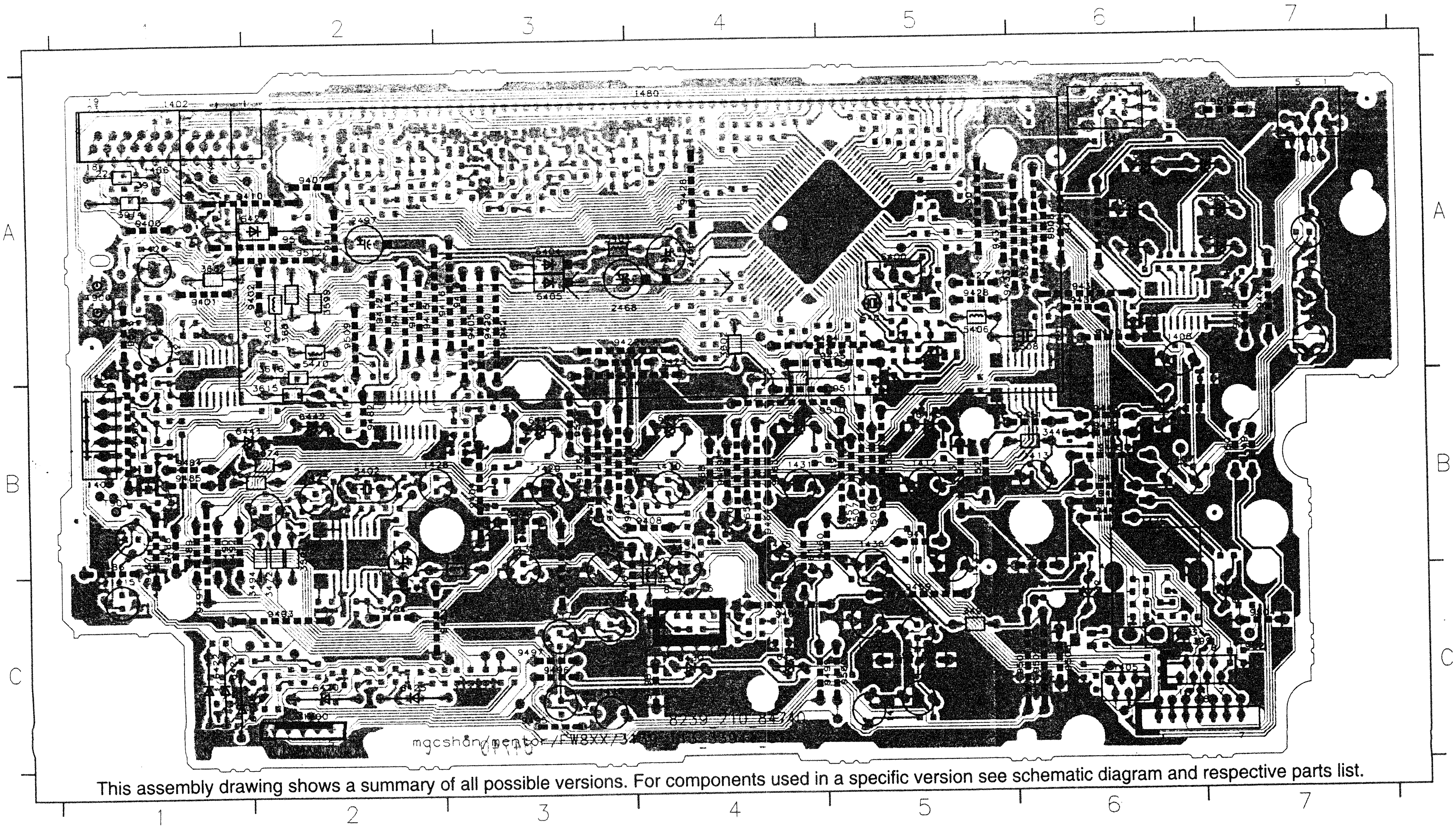
FRONT BOARD

TABLE OF CONTENTS

LCD pin connection 6-1
Front Board - Component and Chip layouts 6-2
Front Board - Circuit diagram & Variation Table 6-3
Key CDC part - Layouts & Circuit diagram 6-4
Standby LED part - Layouts & Circuit diagram 6-4
Jog Rotary part - Layouts & Circuit diagram 6-4
Karaoke part - Layouts & Circuit diagram 6-5
Electrical parts list 6-6

FRONT BOARD - COMPONENT LAYOUT

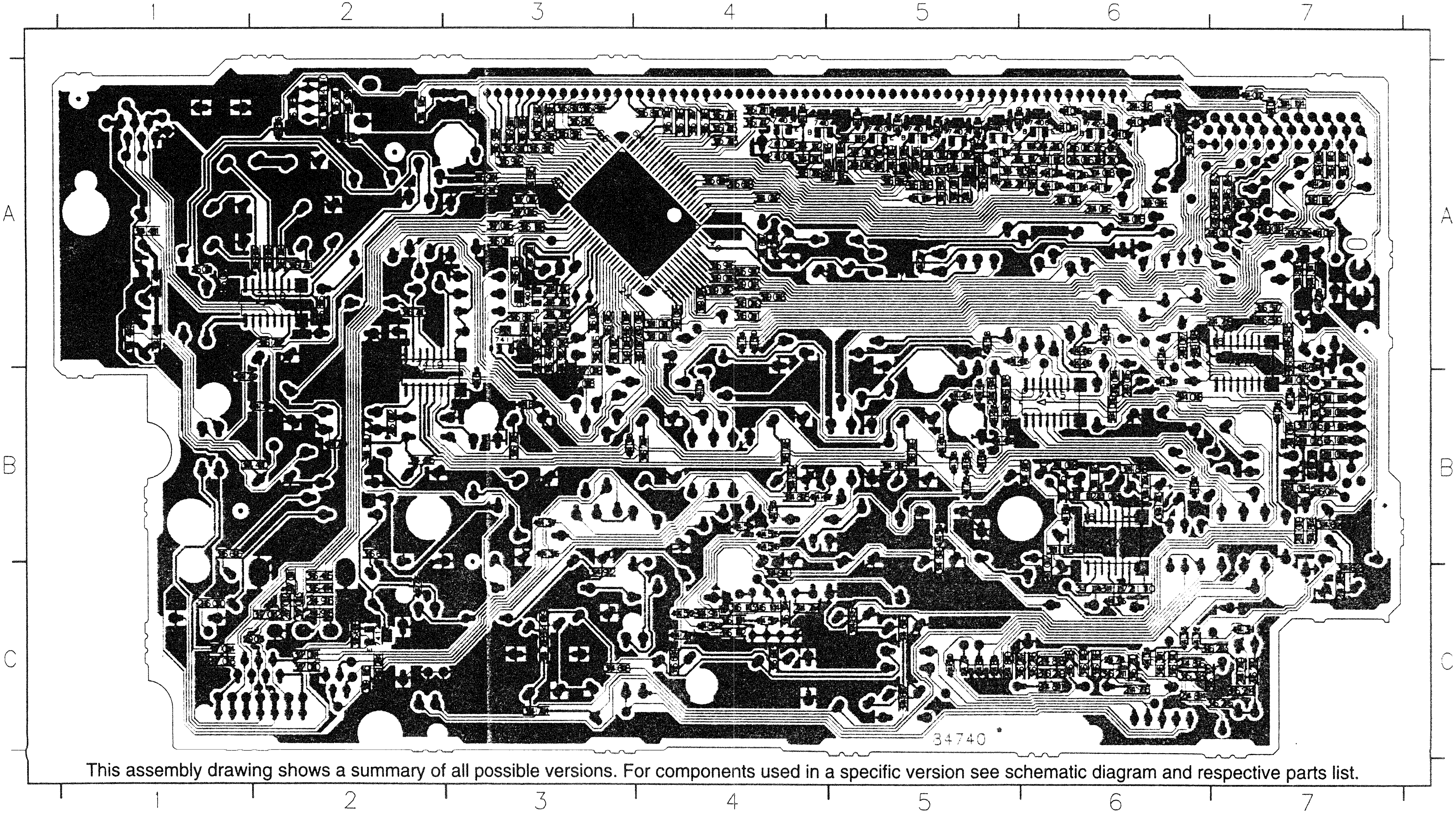
1404	A1
1405	C6
1406	A1
1407	B6
1408	A6
1409	A7
1416	C3
1417	C3
1418	C3
1419	C3
1420	C5
1421	C5
1428	B2
1429	B3
1430	B4
1431	B4
1432	B3
1433	B3
2111	B2
2466	A4
2468	A3
2497	A2
2508	A6
3103	A4
3602	A4
3615	B2
3616	A2
3674	B2
3675	B1
3681	A2
5402	B2
5403	B4
5404	A3
5405	A2
5406	A5
5410	A2
6426	C1
6427	A2
6430	C4
6431	C4
6432	C6
6433	C7
6440	B6
6441	B1
6442	B2
6443	B5
6444	B4
6445	B4
9404	B3
9405	A3
9406	C3
9407	A2
9408	B4
9409	C4
9416	A3
9417	B5
9418	A3
9419	B5
9420	A3
9421	A3
9428	A5
9430	A5
9431	A5
9432	B6
9433	A5
9434	A6
9441	A7
9442	A7
9443	B6
9444	B3
9445	B6
9446	B6
9453	B5
9457	B5
9459	C5
9460	B4
9461	B4
9463	B4
9473	B3
9474	B3
9475	B3
9476	B3
9478	B3
9479	B3
9487	B1
9488	B1
9489	B1
9490	B1
9491	C1
9492	B1
9499	C4
9500	C5
9501	C6
9502	C6
9503	C6
9504	C7
9511	B5
9512	A2
9513	A2
9515	A1
9516	A7
9517	B6


2
3
4
5
6
7
A
B
C
1
1402
1480
2468
2497
5405
5406
5470
3615
3616
9401
9407
9408
9428
9483
9485
9497
1431
1436
8239 210 84740
mgcshan/mentor/FW8XX/31

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CHIP LAYOUT

2403	A4	2464	B5	2486	C6	2601	B7	3109	B7	3412	A6	3471	C3	3569	A5	3589	A3	3612	C4	3638	A2	3670	A2	3707	A3	4403	A7	4423	A7	4443	B5	4463	B3	7404	A4
2405	A5	2465	A3	2490	A2	2701	C2	3110	B7	3413	A5	3473	B6	3570	A4	3590	A3	3613	C4	3639	A2	3671	A2	3708	B3	4404	B4	4424	B7	4444	B5	4464	B3	7406	A6
2406	A5	2467	A4	2491	A2	2702	C2	3111	B7	3414	A7	3474	B6	3571	A4	3591	A3	3614	C4	3640	A2	3672	A2	3709	B3	4405	A6	4425	B7	4445	B5	4465	B5	7407	A5
2407	A5	2469	A3	2492	A3	2703	C1	3112	B6	3415	A2	3480	B6	3572	A4	3592	A3	3618	C6	3641	A3	3673	A2	3900	A4	4406	A6	4426	A6	4446	A5	4466	A2	7408	A3
2408	A4	2470	A3	2493	A3	2900	A7	3113	B6	3420	A6	3483	A7	3573	A4	3593	A3	3619	C6	3643	A3	3676	B3	3901	A4	4407	A6	4427	A5	4447	B4	4467	A2	7411	A3
2409	A5	2471	A3	2494	A3	2901	A7	3114	C6	3440	B2	3484	B7	3574	A4	3594	A3	3620	C6	3644	C2	3677	B4	3902	A4	4408	A6	4428	A6	4448	A6	4468	B5	7412	C2

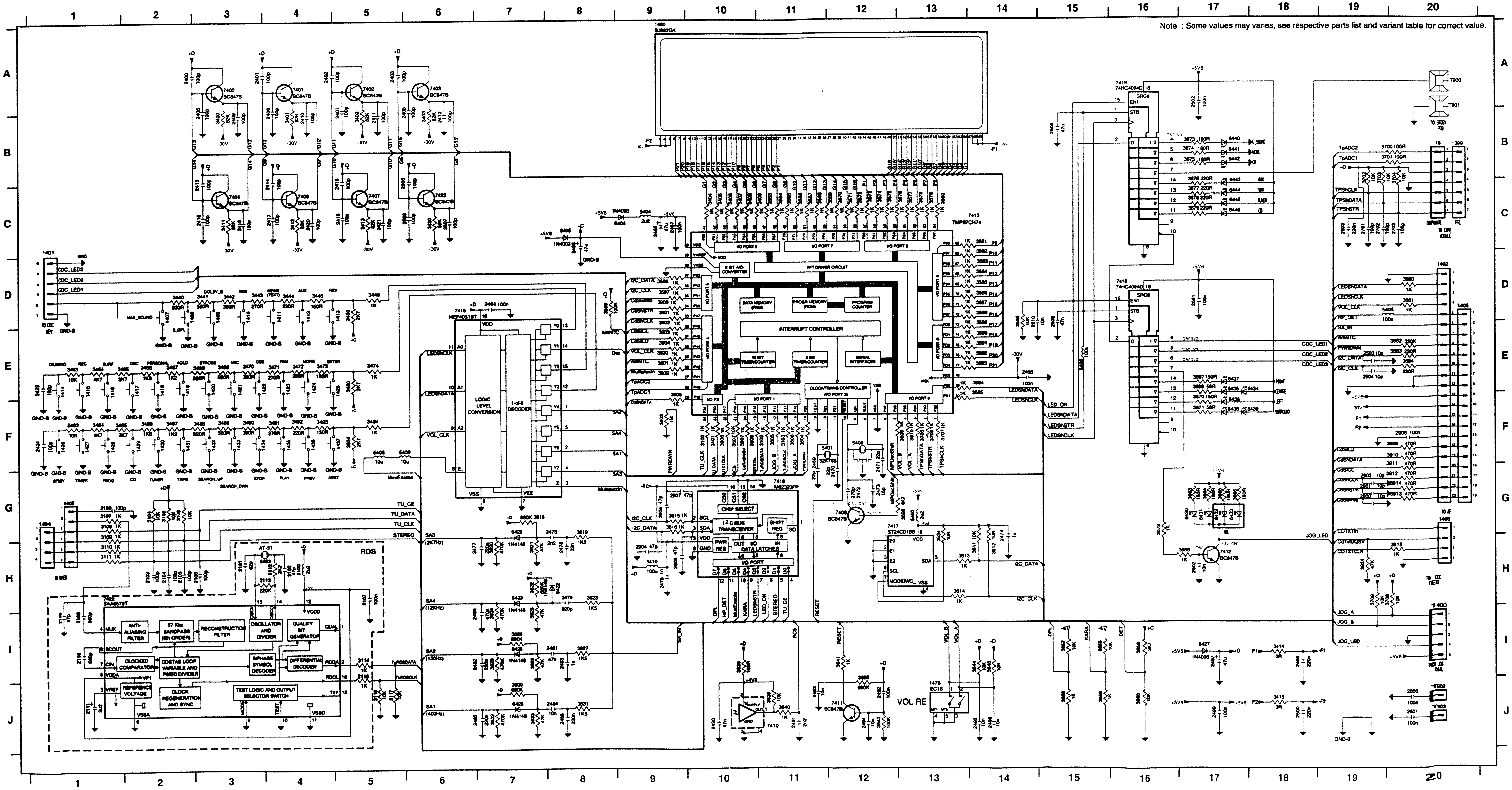


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CIRCUIT DIAGRAM

10 B20	
1399	B20
1400	I20
1401	C1
1402	D20
1403	G1
1404	G1
1405	G20
1406	D20
1407	D2
1408	D3
1409	D3
1410	D3
1411	D4
1412	D4
1413	D6
1414	E1
1415	E1
1416	E1
1417	E2
1418	E2
1419	E2
1420	E3
1421	E3
1422	E4
1423	E4
1424	E4
1425	E5
1426	F1
1427	F1
1428	F1
1429	F2
1430	F2
1431	F2
1432	F3
1433	F3
1434	F4
1435	F4
1436	F4
1437	F5
1476	J13
1480	A9
2100	G1
2101	H3
2102	H4
2103	H2
2104	H2
2105	H2
2106	H3
2107	H6
2108	I1
2109	I1
2110	I1
2111	J1
2400	A2
2401	A3
2402	A4
2403	A5
2405	A3
2406	A4
2407	A5
2408	A6
2409	B3
2410	B4
2411	B5
2412	B6
2413	B3
2414	B4
2415	B5
2416	C3
2417	C4
2418	C5
2419	C3
2420	C4
2421	C5
2429	E1
2431	F1
2464	D7
2465	E14
2466	C9
2467	C9
2468	C9
2469	F11
2470	G12
2471	G12
2472	G12
2473	G12
2474	G14
2475	H9
2476	G8
2477	H7
2478	H8
2479	H8
2480	I7
2481	I8
2482	I7
2483	I8
2484	J8
2485	J7
2486	J8
2490	J10
2491	J11
2492	J12
2493	J11
2494	J12
2495	J14
2496	J14
2497	I17
2498	I16
2499	J17
2500	J18
2501	D17
2502	A17
2503	E19
2504	E19
2505	B6
2506	C6
2507	C6
2508	B15
2509	D15
2510	D14
2600	J20
2601	J20
2602	H17
2701	C19
2702	C19
2703	C20
2900	G19
2901	G19
2902	G19
2903	C19
2904	H9
2905	G9
2906	H9
2907	G9
2908	F20
3100	F10
3101	F10
3102	F11
3103	F11
3104	G2
3105	G2
3106	G2
3107	G1
3108	G1
3109	G1
3110	H1
3111	H1
3112	H4
3113	H4
3114	I5
3115	I5
3116	J5
3117	J5
3400	B3
3401	B4
3402	B5
3403	B6
3404	C10
3405	C10
3406	C10
3407	C10
3408	C10
3409	C11
3411	C3
3412	C4
3413	C5
3414	I18
3415	J18
3420	C6
3440	D2
3441	D3
3442	D3
3443	D3
3444	D4
3445	D4
3446	D5
3450	D6
3463	E1
3464	E1
3465	E2
3466	E2
3467	E2
3468	E3
3469	E3
3470	E3
3471	E4
3472	E4
3473	E4
3474	E5
3480	E5
3483	F1
3484	F1
3485	F1
3486	F2
3487	F2
3488	F3
3489	F3
3490	F3
3491	F4
3492	F4
3493	F4
3494	F5
3504	F5
3563	C11
3564	C11
3565	C11
3566	C11
3567	C11
3568	C11
3569	C12
3570	C12
3571	C12
3572	C12
3573	C12
3574	C12
3575	C12
3576	C13
3577	C13
3578	C13
3579	C13
3580	C13
3581	C14
3582	C14
3583	D14
3584	D14
3585	D14
3586	D14
3587	D14
3588	D14
3589	D14
3590	E14
3591	E14
3592	E14
3593	E14
3594	E14
3595	E14
3596	D9
3597	D9
3598	D9
3600	E9
3601	E9
3602	E9
3603	F9
3604	F11
3605	F11
3606	F11
3607	F10
3608	G13
3609	F13
3610	F13
3611	H14
3612	H14
3613	H13
3614	H13
3615	G9
3616	G9
3618	G7
3619	G8
3620	H7
3621	H7
3622	H7
3623	H8
3624	I7
3625	I7
3626	I7
3627	I8
3628	I7
3629	I7
3630	J7
3631	J8
3632	J7
3633	J7
3634	G13
3638	I10
3639	J11
3640	J11
3641	I12
3643	J12
3644	I14
3645	I14
3655	I15
3656	J15
3657	I15
3658	I16
3659	J15
3660	J16
3663	G17
3664	G17
3665	G17
3666	G17
3667	E17
3668	H17
3669	E17
3670	F17
3671	F17
3672	G16
3673	B17
3674	B17
3675	B17
3676	C17
3677	C17
3678	C17
3679	C17
3680	D20
3681	D20
3682	E20
3683	E20
3684	E20
3685	J12
3686	D14
3700	B19
3701	B19
3702	B19
3703	B19
3704	B20
3705	F13
3706	F13
3707	F13
3708	H20
3709	H19
3800	D9
3801	D9
3802	D9
3803	E9
3804	E9
3805	F9
3806	F10
3807	F10
3808	F10
3809	F20
3810	F20
3811	G20
3812	G20
3813	G20
3814	G20
3815	H20
3824	H19
5100	H4
5400	F12
5401	F12
5402	H4
5403	G13
5404	C9
5405	D20
5406	E15
5408	F5
5409	F6
5410	H9
6404	C9
6405	C8
6420	G7
6422	H8
6423	H7
6425	I7
6426	J7
6427	I17
6430	G17
6431	G17
6432	G17
6433	G17
6434	E18
6435	E17
6436	F17
6437	E17
6438	F17
6439	F18
6440	B17
6441	B17
6442	B17
6443	C17
6444	C17
6445	C17
6446	C17
7400	A3
7401	A4
7402	A5
7403	A6
7404	C3
7406	C4
7407	C5
7408	G12
7410	J11
7411	J12
7412	H17
7413	C14
7415	D6
7416	G11
7417	G12
7418	D16
7419	A16
7422	H1
7423	C6
T900	A20
T901	A20
T902	J20
T903	J20

Note : Some values may varies, see respective parts list and variant table for correct value.



1480
BJ662GK
7413
TMP87CH74
7415
HEF4051BT
7416
M62320FP
7417
ST24C01B6
7418
74HC4094D
7419
74HC4094D
7422
SAA6579T
RDS
AT-51
VOL RE
1401
1402
1403
1404
1405
1406
1399
1400
T900
T901
T902
T903
I/O PORT 6
I/O PORT 7
I/O PORT 8
8 BIT A/D CONVERTER
VFT DRIVER CIRCUIT
DATA MEMORY (RAM)
PROGR MEMORY (ROM)
PROGRAM COUNTER
INTERRUPT CONTROLLER
16 BIT TIMER/COUNTER
8 BIT TIMER/COUNTER
SERIAL INTERFACES
CLOCK/TIMING CONTROLLER
I/O PORT 1
I/O PORT 3
I/O PORT 4
I/O PORT 5
I/O PORT 0
I/O PORT 2
LOGIC LEVEL CONVERSION
1-of-8 DECODER
CHIP SELECT
I²C BUS TRANSCEIVER
SHIFT REG
DATA LATCHES
ANTI-ALIASING FILTER
57 KHz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
CDC_LED3
CDC_LED2
CDC_LED1
DOLBY_S
RDS
NEWS (TEXT)
AUX
REV
MAX_SOUND
DUBBING
REC
SURF
DSC
PERSONAL
HOLD
STROBE
VEC
DBB
PHN
MORE
ENTER
STBY
TIMER
PROG
CD
TUNER
TAPE
SEARCH_UP
SEARCH_DWN
STOP
PLAY
PREV
NEXT
TU_CE
TU_DATA
TU_CLK
STEREO
SA3
SA4
SA2
SA1
I2C_DATA
I2C_CLK
LEDSnDATA
LEDSnCLK
LEDSnSTR
LED_ON
JOG_A
JOG_B
JOG_LED
TO CDC KEY
TO TUNER
TO STDBY PCB
TO TAPE MODULE
TO CDC TEXT
JOG_LED
DPL
KARA
DET
RESET
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
A
B
C
D
E
F
G
H
I
J

PCS 102 636

FRONT BOARD - VARIATIONS TABLE

Front Boards application

51420	FW830C/22/34 , FW840C/22
51810	FW870C/22 , FW878C/34
51820	FW870C/21 , FW878C/21/21M
51830	FW830C/37
51840	FW890P/21/30 , FW898W/21
51850	FW890P/22 , FW898W/34
51860	FW890P/37
52520	FW830C/21

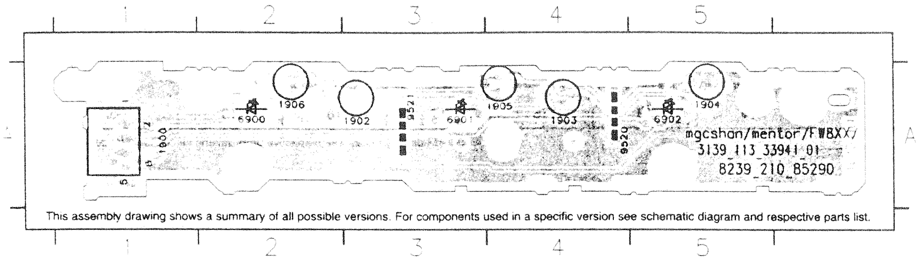
Variations table for Front Board

	51420	51810	51820	51830	51840	51850	51860	52520
16	x	x	-	x	-	x	x	-
1402	-	-	-	-	x	x	x	-
1403	x	x	-	-	-	x	-	-
1404	-	-	x	x	x	-	x	x
1405	-	x	-	-	x	x	-	-
1406	x	x	x	x	-	-	-	x
1408	-	-	-	-	x	x	x	-
1409	x	x	-	-	-	x	-	-
1410	x	x	-	-	x	x	-	-
1411	x	x	-	-	-	x	-	-
1483	x	x	-	x	-	x	x	-
2100	100pF	100pF	-	-	-	100pF	-	-
2101	82pF	82pF	-	-	-	82pF	-	-
2102	47pF	47pF	-	-	-	47pF	-	-
2107	100nF	100nF	-	-	-	100nF	-	-
2108	47pF	47pF	-	-	-	47pF	-	-
2109 , 2110	560pF	560pF	-	-	-	560pF	-	-
2111	2,2µF	2,2µF	-	-	-	2,2µF	-	-
3107	1k	1k	-	-	-	1k	-	-
3112	2k2	2k2	-	-	-	2k2	-	-
3113	220k	220k	-	-	-	220k	-	-
3114 , 3115	1k	1k	-	-	-	1k	-	-
3116 , 3117	-	-	47k	47k	47k	-	47k	47k
3657	10k	10k	10k	10k	-	-	-	10k
3659	-	-	-	-	1k	1k	1k	-
3660	12k	27k	820R	3k9	470R	27k	8k2	180R
3710	220R	220R	-	220R	-	220R	220R	-
3924	47k	-	47k	47k	-	-	47k	47k
5100 , 5402	x	x	-	-	-	x	-	-
6406	x	x	-	x	-	x	x	-
7422	x	x	-	-	-	x	-	-

x = Item in use.

KEY-CDC BOARD - COMPONENT LAYOUT

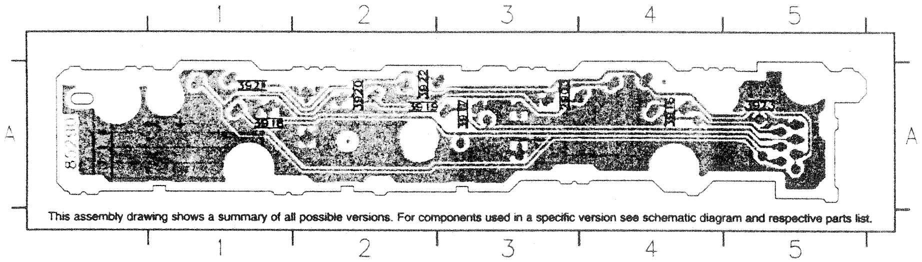
1900 A1 1902 A3 1903 A4 1904 A5 1905 A4 1906 A2 6900 A2 6901 A3 6902 A5 9520 A4 9521 A3


1
2
3
4
5
A
1906
1902
1905
1903
1904
6900
6901
6902
9521
9520
1900
mgcshan/mentor/FW8XX/
3139 113 33941 01
8239 210 85290

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC BOARD - CHIP LAYOUT

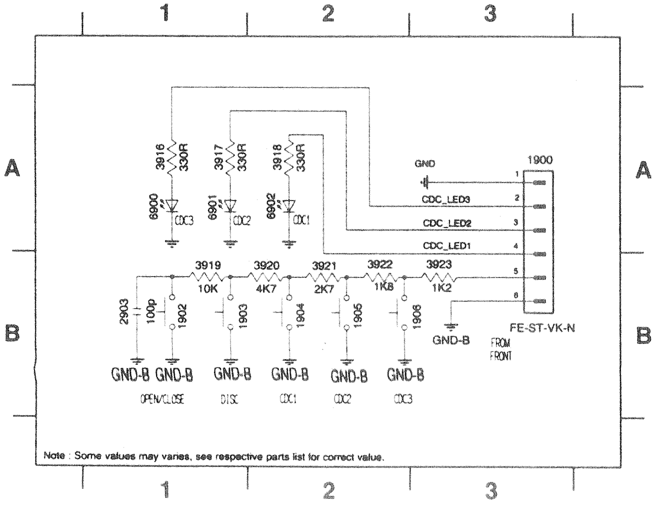
2903 A3 3916 A4 3917 A3 3918 A1 3919 A2 3920 A2 3921 A1 3922 A2 3923 A5


1
2
3
4
5
A
3921
3920
3922
3916
3918

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC PART - CIRCUIT DIAGRAM

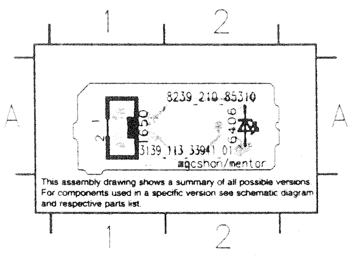
1900 A3 1903 B1 1905 B2 2903 B1 3917 A1 3919 B1 3921 B2 3923 B3 6901 A1
1902 B1 1904 B2 1906 B3 3916 A1 3918 A2 3920 B2 3922 B2 6900 A1 6902 A2


1
2
3
A
B
3916
330R
3917
330R
3918
330R
6900
CDC3
6901
CDC2
6902
CDC1
GND
1900
CDC_LED3
CDC_LED2
CDC_LED1
1
2
3
4
5
6
3919
10K
3920
4K7
3921
2K7
3922
1K8
3923
1K2
2903
100p
1902
1903
1904
1905
1906
GND-B
FE-ST-VK-N
FROM FRONT
GND-B GND-B GND-B GND-B GND-B GND-B
OPEN/CLOSE
DISC
CDC1
CDC2
CDC3

Note : Some values may varies, see respective parts list for correct value.

STANDBY LED BOARD - COMPONENT LAYOUT

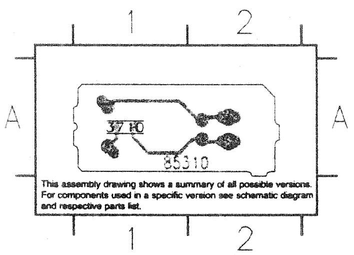
1650 A1 6406 A2


1
2
A
8239 210 85310
1650
6406
3139 113 33941 01
mgcshan/mentor

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED BOARD - CHIP LAYOUT

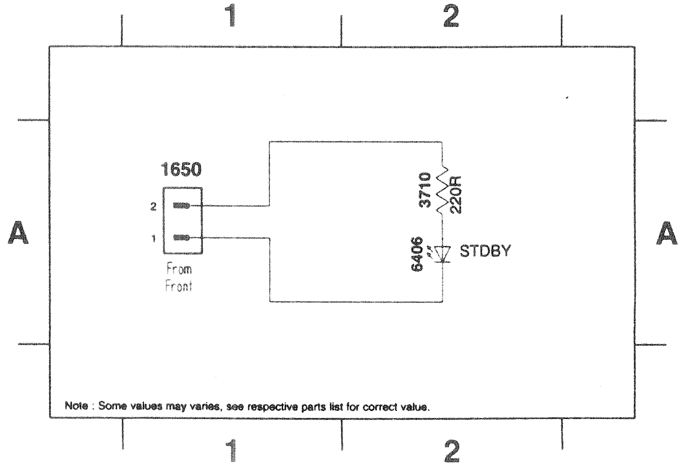
3710 A1


1
2
A
3710
85310

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED PART - CIRCUIT DIAGRAM

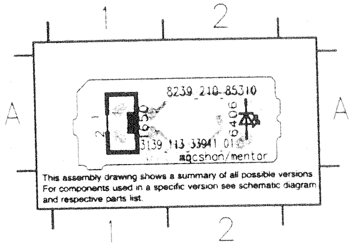
1650 A1 3710 A2 6406 A2


1
2
A
1650
2
1
From Front
3710
220R
6406
STDBY

Note : Some values may varies, see respective parts list for correct value.

STANDBY LED BOARD - COMPONENT LAYOUT

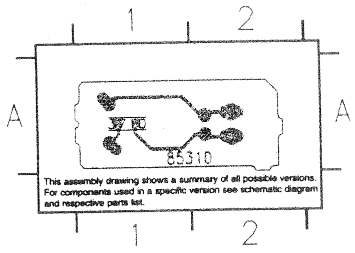
1650 A1 6406 A2


1
2
A
A
8239 210 85310
1650
6406
3139 113 33941 01
mgcshon/mentor
1
2

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED BOARD - CHIP LAYOUT

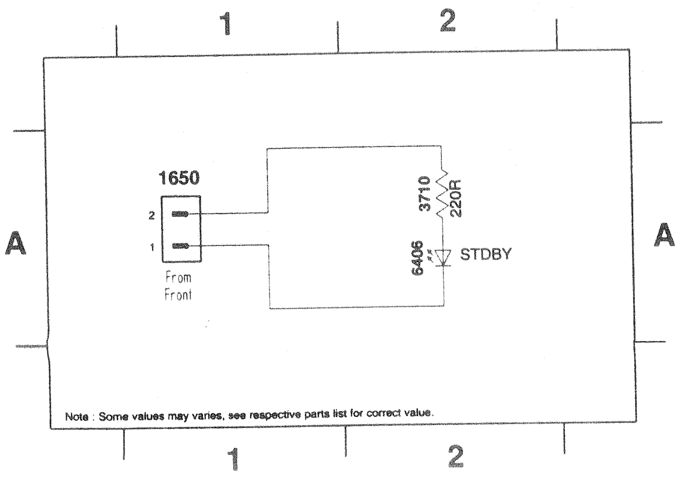
3710 A1


1
2
A
A
3710
85310
1
2

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED PART - CIRCUIT DIAGRAM

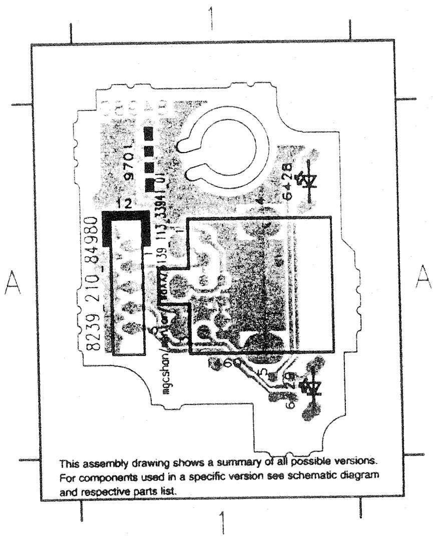
1650 A1 **3710 A2** **6406 A2**


1
2
A
A
1650
2
1
From
Front
3710
220R
6406
STDBY
1
2

Note : Some values may varies, see respective parts list for correct value.

JOG ROTARY BOARD - COMPONENT LAYOUT

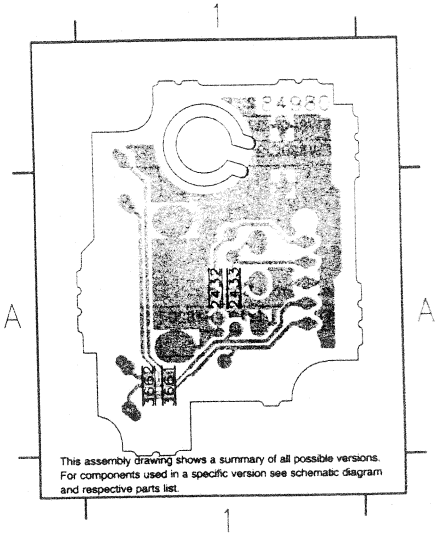
12 A1
1460 A1
6428 A1
6429 A1
9701 A1


1
A
A
9701
12
6428
8239 210 84980
3139 113 33941 01
mgcshon/mentor
1460
6429
1

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

JOG ROTARY BOARD - CHIP LAYOUT

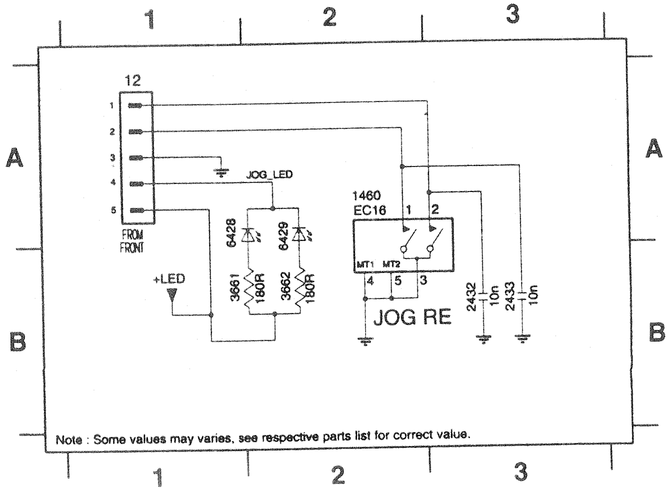
2432 A1
2433 A1
3661 A1
3662 A1


1
A
A
84980
2432
2433
3662
3661
1

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

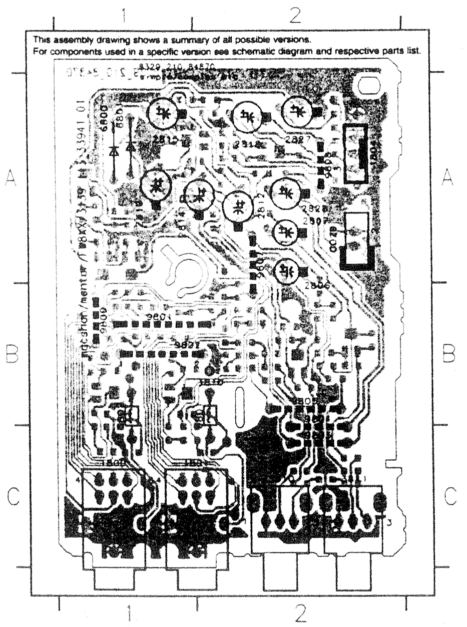
JOG ROTARY PART - CIRCUIT DIAGRAM

12 A1 **1460 A2** **2432 B3** **2433 B3** **3661 B1** **3662 B2** **6428 A1** **6429 A2**


1
2
3
A
A
B
B
12
1
2
3
4
5
FROM
FRONT
JOG_LED
+LED
6428
6429
3661
180R
3662
180R
1460
EC16
1
2
MT1
MT2
4
5
3
JOG RE
2432
10n
2433
10n
1
2
3

Note : Some values may varies, see respective parts list for correct value.

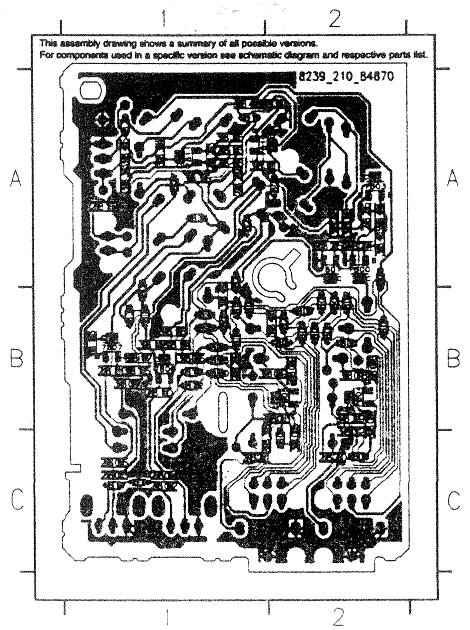
KARAOKE BOARD - COMPONENT LAYOUT



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

0029	A2
1800	C1
1801	C1
1804	A2
1810	B2
2806	B2
2807	A2
2812	A2
2814	A1
2815	A1
2818	A2
2819	A1
2827	A2
2828	A2
3810	C2
3811	C2
5801	B2
5802	B1
6800	A1
6801	A1
9800	B1
9801	B1
9802	B1
9803	C2
9804	B2
9805	B2
9807	A2
9808	A2

KARAOKE BOARD - CHIP LAYOUT

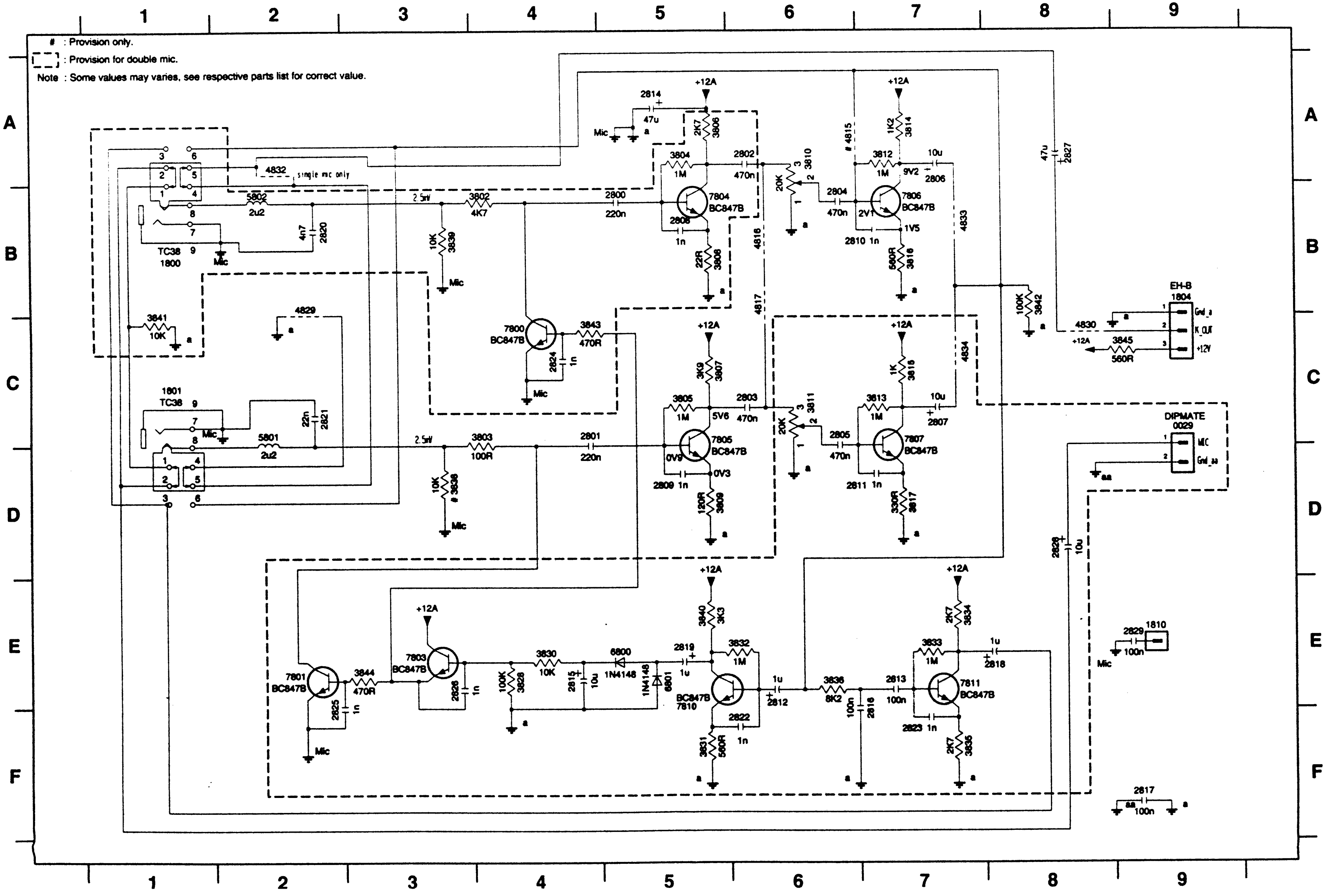


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

2800	C2
2801	C2
2802	C1
2803	C1
2804	C1
2805	C1
2808	B2
2809	B2
2810	B1
2811	B1
2813	A1
2816	A1
2817	A1
2820	C2
2821	C1
2822	A1
2823	A1
2824	A2
2825	A2
2826	A2
2829	B1
3802	C2
3803	B2
3804	B2
3805	C2
3806	B1
3807	B1
3808	B2
3809	B2
3812	B1
3813	B1
3814	B1
3815	B1
3816	B1
3817	B1
3828	A2
3830	A2
3831	A1
3832	A2
3833	A1
3834	A1
3835	A1
3836	A1
3838	C1
3839	B2
3840	A1
3841	B2
3842	B1
3843	A2
3844	A2
3845	A1
4800	B2
4801	B2
4802	B2
4803	B2
4804	B2
4805	B2
4806	B2
4807	B2
4808	A2
4810	B1
4811	B1
4812	B1
4813	B1
4814	A1
4815	B1
4816	C1
4817	C1
4818	B1
4819	B1
4820	B1
4821	B1
4822	B1
4823	B1
4824	A1
4825	A1
4826	A2
4827	A1
4828	B1
4829	B2
4830	A1
4831	B2
4832	B2
4833	B1
4834	A1
4835	B1
7800	A2
7801	A2
7803	A2
7804	B2
7805	B2
7806	B1
7807	B1
7810	A1
7811	A1

KARAOKE PART - CIRCUIT DIAGRAM

0029 C9	1810 E9	2803 C6	2807 C7	2811 D6	2815 E4	2819 E5	2823 F7	2827 A8	3803 C4	3807 C5	3811 C6	3815 C7	3830 E4	3834 E7	3839 B3	3843 C4	4816 B6	4832 A2	5802 B2	7801 E2	7806 B7
1800 B1	2800 B5	2804 B6	2808 B5	2812 E6	2816 E7	2820 B2	2824 C4	2828 D8	3804 A5	3808 B5	3812 A7	3816 B7	3831 F5	3835 F7	3840 E5	3844 E3	4817 B6	4833 B7	6800 E5	7803 E3	7807 C7
1801 C1	2801 C4	2805 C6	2809 D5	2813 E7	2817 F9	2821 C2	2825 E2	2829 E9	3805 C5	3809 D5	3813 C7	3817 D7	3832 E6	3836 E6	3841 C1	3845 C9	4829 B2	4834 C7	6801 E5	7804 B5	7810 F5
1804 B9	2802 A6	2806 A7	2810 B6	2814 A5	2818 E8	2822 F6	2826 E3	3802 B4	3806 A5	3810 A6	3814 A7	3828 E4	3833 E7	3838 D3	3842 B8	4815 A6	4830 C8	5801 C2	7800 C4	7805 C5	7811 E7


: Provision only.

[ ] : Provision for double mic.

Note : Some values may varies, see respective parts list for correct value.

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
4832
single mic only
5802
2u2
4n7
2820
TC38
1800
Mic
3841
10K
4829
1801
TC38
22n
2821
5801
2u2
2.5mV
3802
4K7
10K
3839
3803
100R
10K
# 3838
2800
220n
2801
220n
7800
BC847B
3843
470R
2824
1n
+12A
2814
47u
3804
1M
2802
470n
2K7
3806
7804
BC847B
2808
1n
22R
3808
4816
4817
3K9
3807
3805
1M
5V6
2803
470n
7805
BC847B
0V9
0V3
2809 1n
120R
3809
20K
3810
2804
470n
20K
3811
2805
470n
# 4815
1K2
3814
3812
1M
9V2
10u
2806
7806
BC847B
2V1
1V5
2810 1n
560R
3816
4833
1K
3815
3813
1M
10u
2807
7807
BC847B
2811 1n
330R
3817
4834
47u
2827
100K
3842
4830
3845
560R
EH-B
1804
Gnd_a
K_OUT
+12V
DIPMATE
0029
MIC
Gnd_aa
2828
10u
7801
BC847B
3844
470R
2825
1n
7803
BC847B
2826
1n
100K
3828
3830
10K
2815
10u
6800
1N4148
6801
1N4148
2819
1u
3840
3K3
3832
1M
BC847B
7810
2822
1n
3831
560R
1u
2812
3836
8K2
100n
2816
2813
100n
3833
1M
2K7
3834
7811
BC847B
1u
2818
2823 1n
2K7
3835
2829
100n
1810
2817
100n
a
aa

MISCELLANEOUS

1399	4822 267 10953	Flex Connector 7P
1401	4822 265 11207	Flex Connector 6P
1406	4822 265 11545	Flex Connector 19P
1407	4822 276 13775	Tact Switch
1408	4822 276 13775	Tact Switch
1412	4822 276 13775	Tact Switch
1413	4822 276 13775	Tact Switch
1414	4822 276 13775	Tact Switch
1415	4822 276 13775	Tact Switch
1416	4822 276 13775	Tact Switch
1417	4822 276 13775	Tact Switch
1418	4822 276 13775	Tact Switch
1419	4822 276 13775	Tact Switch
1420	4822 276 13775	Tact Switch
1421	4822 276 13775	Tact Switch
1422	4822 276 13775	Tact Switch
1423	4822 276 13775	Tact Switch
1424	4822 276 13775	Tact Switch
1425	4822 276 13775	Tact Switch
1426	4822 276 13775	Tact Switch
1427	4822 276 13775	Tact Switch
1428	4822 276 13775	Tact Switch
1429	4822 276 13775	Tact Switch
1430	4822 276 13775	Tact Switch
1431	4822 276 13775	Tact Switch
1432	4822 276 13775	Tact Switch
1433	4822 276 13775	Tact Switch
1434	4822 276 13775	Tact Switch
1435	4822 276 13775	Tact Switch
1436	4822 276 13775	Tact Switch
1437	4822 276 13775	Tact Switch
1460	4822 273 10371	Rotary Encoder 24P
1476	4822 273 10365	Rotary Encoder 24P
1480	4822 135 00272	FTD Display
1801	4822 265 11529	Headphone Socket
1900	4822 265 11207	Flex Connector 6P
1902	4822 276 13775	Tact Switch
1903	4822 276 13775	Tact Switch
1904	4822 276 13775	Tact Switch
1905	4822 276 13775	Tact Switch
1906	4822 276 13775	Tact Switch

CAPACITORS

2103	5322 122 32531	100pF 5% 50V
2104	5322 122 32531	100pF 5% 50V
2105	5322 122 32531	100pF 5% 50V
2106	5322 122 32531	100pF 5% 50V
2400	5322 122 32531	100pF 5% 50V
2401	5322 122 32531	100pF 5% 50V
2402	5322 122 32531	100pF 5% 50V
2403	5322 122 32531	100pF 5% 50V
2405	5322 122 32531	100pF 5% 50V
2406	5322 122 32531	100pF 5% 50V
2407	5322 122 32531	100pF 5% 50V
2408	5322 122 32531	100pF 5% 50V
2409	5322 122 32531	100pF 5% 50V
2410	5322 122 32531	100pF 5% 50V
2411	5322 122 32531	100pF 5% 50V
2412	5322 122 32531	100pF 5% 50V
2413	5322 122 32531	100pF 5% 50V
2414	5322 122 32531	100pF 5% 50V
2415	5322 122 32531	100pF 5% 50V
2416	5322 122 32531	100pF 5% 50V
2417	5322 122 32531	100pF 5% 50V
2418	5322 122 32531	100pF 5% 50V
2419	5322 122 32531	100pF 5% 50V
2420	5322 122 32531	100pF 5% 50V
2421	5322 122 32531	100pF 5% 50V
2429	5322 122 32531	100pF 5% 50V
2431	5322 122 32531	100pF 5% 50V
2432	4822 122 33177	10nF 20% 50V
2433	4822 122 33177	10nF 20% 50V
2464	4822 126 13196	100nF 10% 25V
2465	4822 126 10002	100nF 20% 25V
2466	4822 124 81286	47µF 20% 16V
2467	4822 126 13196	100nF 10% 25V
2468	4822 124 81286	47µF 20% 16V
2469	5322 122 32658	22pF 5% 50V
2470	5322 122 32658	22pF 5% 50V
2471	5322 122 32658	22pF 5% 50V
2472	4822 122 33216	270pF 5% 50V
2473	4822 126 13486	15pF 2% 63V
2474	4822 126 13836	1µF 16V
2475	4822 126 13836	1µF 16V
2476	4822 122 33175	2,2nF 20% 50V
2477	4822 126 13061	220nF 20% 25V
2478	4822 126 12105	33nF 5% 50V
2479	4822 122 33806	820pF 10% 63V
2480	4822 126 13482	470nF +80/-20% 16V
2481	4822 122 33797	47nF 20% 50V
2482	4822 126 13061	220nF 20% 25V
2483	4822 126 13836	1µF 16V
2484	4822 122 33177	10nF 20% 50V
2485	4822 126 13061	220nF 20% 25V
2486	4822 126 13061	220nF 20% 25V
2490	4822 122 33797	47nF 20% 50V
2491	4822 122 33175	2,2nF 20% 50V
2492	4822 126 13196	100nF 10% 25V
2493	4822 122 33177	10nF 20% 50V
2494	4822 122 33177	10nF 20% 50V
2495	4822 122 33177	10nF 20% 50V
2496	4822 122 33177	10nF 20% 50V

2497	4822 124 81286	47µF 20% 16V
2498	4822 126 13473	220nF +80/-20% 50V
2499	4822 126 13196	100nF 10% 25V
2500	4822 126 13473	220nF +80/-20% 50V
2501	4822 126 13196	100nF 10% 25V
2502	4822 126 13196	100nF 10% 25V
2503	5322 122 32448	10pF 5% 63V
2504	5322 122 32448	10pF 5% 63V
2505	5322 122 32531	100pF 5% 50V
2506	5322 122 32531	100pF 5% 50V
2507	5322 122 32531	100pF 5% 50V
2508	4822 126 12785	47nF 50V
2509	4822 126 13751	47nF 10% 63V
2600	4822 126 13196	100nF 10% 25V
2601	4822 126 13196	100nF 10% 25V
2701	5322 122 32531	100pF 5% 50V
2702	5322 122 32531	100pF 5% 50V
2703	5322 122 32531	100pF 5% 50V
2801	4822 126 13061	220nF 20% 25V
2803	4822 126 13482	470nF +80/-20% 16V
2804	4822 126 13482	470nF +80/-20% 16V
2806	4822 124 41579	10µF 20% 50V
2809	5322 122 34123	1nF 10% 50V
2810	5322 122 34123	1nF 10% 50V
2814	4822 124 40433	47µF 20% 25V
2817	4822 126 13196	100nF 10% 25V
2821	5322 122 32654	22nF 10% 63V
2827	4822 124 40433	47µF 20% 25V
2829	4822 126 13838	100nF +80/-20% 50V
2900	5322 122 32531	100pF 5% 50V
2901	5322 122 32531	100pF 5% 50V
2902	5322 122 32531	100pF 5% 50V
2903	5322 122 32531	100pF 5% 50V
2904	4822 126 13692	47pF 1% 63V
2905	4822 126 13692	47pF 1% 63V
2906	4822 126 13692	47pF 1% 63V
2907	4822 126 13692	47pF 1% 63V

RESISTORS

3100	4822 051 10102	1k 2% 0,25W
3101	4822 051 10102	1k 2% 0,25W
3102	4822 051 10102	1k 2% 0,25W
3103	4822 050 11002	1k 1% 0,4W
3104	4822 117 10833	10k 1% 0,1W
3105	4822 117 10833	10k 1% 0,1W
3106	4822 117 10833	10k 1% 0,1W
3108	4822 051 10102	1k 2% 0,25W
3109	4822 051 10102	1k 2% 0,25W
3110	4822 051 10102	1k 2% 0,25W
3111	4822 051 10102	1k 2% 0,25W
3116	4822 117 10834	47k 1% 0,1W
3117	4822 117 10834	47k 1% 0,1W
3400	4822 117 11149	82k 1% 0,1W
3401	4822 117 11149	82k 1% 0,1W
3402	4822 117 11149	82k 1% 0,1W
3403	4822 117 11149	82k 1% 0,1W
3404	4822 051 10102	1k 2% 0,25W
3405	4822 051 10102	1k 2% 0,25W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 051 10102	1k 2% 0,25W
3409	4822 051 10102	1k 2% 0,25W
3411	4822 117 11149	82k 1% 0,1W
3412	4822 117 11149	82k 1% 0,1W
3413	4822 117 11149	82k 1% 0,1W
3414	4822 051 20008	0R Jumper 0805
3415	4822 051 20008	0R Jumper 0805
3420	4822 117 11149	82k 1% 0,1W
3440	4822 117 11454	820R 1% 0,1W
3441	4822 051 20561	560R 5% 0,1W
3442	4822 051 20391	390R 5% 0,1W
3443	4822 117 11504	270R 1% 0,1W
3444	4822 117 11503	220R 1% 0,1W
3445	4822 117 10353	150R 1% 0,1W
3446	4822 050 11002	1k 1% 0,4W
3450	4822 117 12955	2k7 1% 0,1W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 051 20472	4k7 5% 0,1W
3465	4822 117 12955	2k7 1% 0,1W
3466	4822 051 20182	1k8 5% 0,1W
3467	4822 051 20122	1k2 5% 0,1W
3468	4822 117 11454	820R 1% 0,1W
3469	4822 051 20561	560R 5% 0,1W
3470	4822 051 20391	390R 5% 0,1W
3471	4822 117 11504	270R 1% 0,1W
3472	4822 116 83872	220R 5% 0,5W
3473	4822 117 10353	150R 1% 0,1W
3474	4822 051 10102	1k 2% 0,25W
3480	4822 117 12955	2k7 1% 0,1W
3483	4822 117 10833	10k 1% 0,1W
3484	4822 051 20472	4k7 5% 0,1W
3485	4822 117 12955	2k7 1% 0,1W
3486	4822 051 20182	1k8 5% 0,1W
3487	4822 051 20122	1k2 5% 0,1W
3488	4822 117 11454	820R 1% 0,1W
3489	4822 051 20561	560R 5% 0,1W
3490	4822 051 20391	390R 5% 0,1W
3491	4822 117 11504	270R 1% 0,1W
3492	4822 117 11503	220R 1% 0,1W
3493	4822 116 83868	150R 5% 0,5W
3494	4822 050 11002	1k 1% 0,4W
3504	4822 116 52263	2k7 5% 0,5W

3563	4822 051 10102
3564	4822 051 10102
3565	4822 051 10102
3566	4822 051 10102
3567	4822 051 10102
3568	4822 051 10102
3569	4822 051 10102
3570	4822 051 10102
3571	4822 051 10102
3572	4822 051 10102
3573	4822 051 10102
3574	4822 051 10102
3575	4822 051 10102
3576	4822 051 10102
3577	4822 051 10102
3578	4822 051 10102
3579	4822 051 10102
3580	4822 051 10102
3581	4822 051 10102
3582	4822 051 10102
3583	4822 051 10102
3584	4822 051 10102
3585	4822 051 10102
3586	4822 051 10102
3587	4822 051 10102
3588	4822 051 10102
3589	4822 051 10102
3590	4822 051 10102
3591	4822 051 10102
3592	4822 051 10102
3593	4822 051 10102
3594	4822 051 10102
3595	4822 051 10102
3596	4822 051 10102
3597	4822 051 10102
3599	4822 116 52234
3600	4822 051 10102
3601	4822 051 10102
3602	4822 050 11002
3603	4822 051 20105
3604	4822 051 10102
3605	4822 051 10102
3606	4822 051 10102
3607	4822 117 10833
3608	4822 051 20472
3609	4822 051 10102
3610	4822 051 10102
3611	4822 117 10833
3612	4822 117 10833
3613	4822 051 10102
3614	4822 051 10102

ELECTRICAL PARTS LIST - FRONT BOARD

3563	4822 051 10102	1k 2% 0,25W
3564	4822 051 10102	1k 2% 0,25W
3565	4822 051 10102	1k 2% 0,25W
3566	4822 051 10102	1k 2% 0,25W
3567	4822 051 10102	1k 2% 0,25W
3568	4822 051 10102	1k 2% 0,25W
3569	4822 051 10102	1k 2% 0,25W
3570	4822 051 10102	1k 2% 0,25W
3571	4822 051 10102	1k 2% 0,25W
3572	4822 051 10102	1k 2% 0,25W
3573	4822 051 10102	1k 2% 0,25W
3574	4822 051 10102	1k 2% 0,25W
3575	4822 051 10102	1k 2% 0,25W
3576	4822 051 10102	1k 2% 0,25W
3577	4822 051 10102	1k 2% 0,25W
3578	4822 051 10102	1k 2% 0,25W
3579	4822 051 10102	1k 2% 0,25W
3580	4822 051 10102	1k 2% 0,25W
3581	4822 051 10102	1k 2% 0,25W
3582	4822 051 10102	1k 2% 0,25W
3583	4822 051 10102	1k 2% 0,25W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 10102	1k 2% 0,25W
3586	4822 051 10102	1k 2% 0,25W
3587	4822 051 10102	1k 2% 0,25W
3588	4822 051 10102	1k 2% 0,25W
3589	4822 051 10102	1k 2% 0,25W
3590	4822 051 10102	1k 2% 0,25W
3591	4822 051 10102	1k 2% 0,25W
3592	4822 051 10102	1k 2% 0,25W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 10102	1k 2% 0,25W
3596	4822 051 10102	1k 2% 0,25W
3597	4822 051 10102	1k 2% 0,25W
3599	4822 116 52234	100k 5% 0,5W
3600	4822 051 10102	1k 2% 0,25W
3601	4822 051 10102	1k 2% 0,25W
3602	4822 050 11002	1k 1% 0,4W
3603	4822 051 20105	1M 5% 0,1W
3604	4822 051 10102	1k 2% 0,25W
3605	4822 051 10102	1k 2% 0,25W
3606	4822 051 10102	1k 2% 0,25W
3607	4822 117 10833	10k 1% 0,1W
3608	4822 051 20472	4k7 5% 0,1W
3609	4822 051 10102	1k 2% 0,25W
3610	4822 051 10102	1k 2% 0,25W
3611	4822 117 10833	10k 1% 0,1W
3612	4822 117 10833	10k 1% 0,1W
3613	4822 051 10102	1k 2% 0,25W
3614	4822 051 10102	1k 2% 0,25W

3615	4822 050 11002	1k 1% 0,4W
3616	4822 050 11002	1k 1% 0,4W
3618	4822 051 20684	680k 5% 0,1W
3619	4822 117 11139	1k5 1% 0,1W
3620	4822 051 20474	470k 5% 0,1W
3621	4822 117 10834	47k 1% 0,1W
3622	4822 051 20684	680k 5% 0,1W
3623	4822 117 11139	1k5 1% 0,1W
3624	4822 051 20474	470k 5% 0,1W
3625	4822 117 10834	47k 1% 0,1W
3626	4822 051 20684	680k 5% 0,1W
3627	4822 117 11139	1k5 1% 0,1W
3628	4822 051 20474	470k 5% 0,1W
3629	4822 117 10834	47k 1% 0,1W
3630	4822 051 20684	680k 5% 0,1W
3631	4822 117 11139	1k5 1% 0,1W
3632	4822 051 20474	470k 5% 0,1W
3633	4822 117 10834	47k 1% 0,1W
3634	4822 117 10833	10k 1% 0,1W
3638	4822 051 20101	100R 5% 0,1W
3639	4822 117 10833	10k 1% 0,1W
3640	4822 051 10102	1k 2% 0,25W
3641	4822 051 10102	1k 2% 0,25W
3643	4822 051 20104	100k 5% 0,1W
3644	4822 117 10833	10k 1% 0,1W
3645	4822 117 10833	10k 1% 0,1W
3656	4822 051 10102	1k 2% 0,25W
3657	4822 117 10833	10k 1% 0,1W
3658	4822 117 12955	2k7 1% 0,1W
3660	4822 117 11448	180R 1% 0,1W /21
3660	4822 051 20392	3k9 5% 0,1W /37
3661	4822 117 11448	180R 1% 0,1W
3662	4822 117 11448	180R 1% 0,1W
3663	4822 117 11448	180R 1% 0,1W
3664	4822 117 11448	180R 1% 0,1W
3665	4822 117 11448	180R 1% 0,1W
3666	4822 117 11448	180R 1% 0,1W
3667	4822 117 10353	150R 1% 0,1W
3668	4822 051 10102	1k 2% 0,25W
3669	4822 051 20569	56R 5% 0,1W
3670	4822 117 10353	150R 1% 0,1W
3671	4822 051 20569	56R 5% 0,1W
3672	4822 051 10102	1k 2% 0,25W
3673	4822 117 11448	180R 1% 0,1W
3674	4822 116 52213	180R 5% 0,1W
3675	4822 116 52213	180R 5% 0,1W
3676	4822 117 11503	220R 1% 0,1W
3677	4822 117 11503	220R 1% 0,1W
3678	4822 117 11503	220R 1% 0,1W
3679	4822 117 11503	220R 1% 0,1W
3680	4822 051 10102	1k 2% 0,25W

RESISTORS

3681	4822 050 11002	1k 1% 0,4W
3682	4822 116 52272	330k 5% 0,5W
3683	4822 117 11503	220R 1% 0,1W
3684	4822 117 11503	220R 1% 0,1W
3686	4822 117 10833	10k 1% 0,1W
3700	4822 051 20101	100R 5% 0,1W
3701	4822 051 20101	100R 5% 0,1W
3702	4822 117 10833	10k 1% 0,1W
3703	4822 117 10833	10k 1% 0,1W
3704	4822 117 10833	10k 1% 0,1W
3705	4822 051 10102	1k 2% 0,25W
3706	4822 051 10102	1k 2% 0,25W
3707	4822 051 10102	1k 2% 0,25W
3708	4822 117 10833	10k 1% 0,1W
3709	4822 117 10833	10k 1% 0,1W
3710	4822 117 11503	220R 1% 0,1W
3803	4822 051 20101	100R 5% 0,1W
3805	4822 051 20105	1M 5% 0,1W
3807	4822 051 20392	3k9 5% 0,1W
3809	4822 051 20121	120R 5% 0,1W
3810	4822 101 21204	20kA POTM
3812	4822 051 20105	1M 5% 0,1W
3814	4822 051 20122	1k2 5% 0,1W
3816	4822 051 20561	560R 5% 0,1W
3842	4822 051 20104	100k 5% 0,1W
3845	4822 051 20008	0R Jumper 0805
3900	4822 051 10102	1k 2% 0,25W
3901	4822 051 10102	1k 2% 0,25W
3902	4822 051 10102	1k 2% 0,25W
3903	4822 051 10102	1k 2% 0,25W
3904	4822 051 10102	1k 2% 0,25W
3905	4822 051 10102	1k 2% 0,25W
3906	4822 051 10102	1k 2% 0,25W
3907	4822 051 10102	1k 2% 0,25W
3908	4822 051 10102	1k 2% 0,25W
3909	4822 051 20471	470R 5% 0,1W
3910	4822 051 20471	470R 5% 0,1W
3911	4822 051 20471	470R 5% 0,1W
3912	4822 051 20471	470R 5% 0,1W
3913	4822 116 83883	470R 5% 0,5W
3914	4822 116 83883	470R 5% 0,5W
3915	4822 051 10102	1k 2% 0,25W
3916	4822 051 20331	330R 5% 0,1W
3917	4822 051 20331	330R 5% 0,1W
3918	4822 051 20331	330R 5% 0,1W
3919	4822 117 10833	10k 1% 0,1W
3920	4822 051 20472	4k7 5% 0,1W
3921	4822 117 12955	2k7 1% 0,1W
3922	4822 051 20182	1k8 5% 0,1W
3923	4822 051 20122	1k2 5% 0,1W
3924	4822 117 10834	47k 1% 0,1W
4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4404	4822 051 20008	0R Jumper 0805
4405	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4409	4822 051 20008	0R Jumper 0805
4410	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4415	4822 051 20008	0R Jumper 0805
4416	4822 051 20008	0R Jumper 0805
4417	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4422	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4432	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805

4452	4822 051 20008	0R Jumper 0805
4453	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4457	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4459	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4461	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4470	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4472	4822 051 20008	0R Jumper 0805
4476	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4800	4822 051 20008	0R Jumper 0805
4801	4822 051 20008	0R Jumper 0805
4802	4822 051 20008	0R Jumper 0805
4803	4822 051 20008	0R Jumper 0805
4804	4822 051 20008	0R Jumper 0805
4805	4822 051 20008	0R Jumper 0805
4806	4822 051 20008	0R Jumper 0805
4807	4822 051 20008	0R Jumper 0805
4808	4822 051 20008	0R Jumper 0805
4809	4822 051 20008	0R Jumper 0805
4810	4822 051 20008	0R Jumper 0805
4811	4822 051 20008	0R Jumper 0805
4812	4822 051 20008	0R Jumper 0805
4813	4822 051 20008	0R Jumper 0805
4814	4822 051 20008	0R Jumper 0805
4816	4822 051 20008	0R Jumper 0805
4817	4822 051 20008	0R Jumper 0805
4818	4822 051 20008	0R Jumper 0805
4819	4822 051 20008	0R Jumper 0805
4820	4822 051 20008	0R Jumper 0805
4821	4822 051 20008	0R Jumper 0805
4822	4822 051 20008	0R Jumper 0805
4823	4822 051 20008	0R Jumper 0805
4824	4822 051 20008	0R Jumper 0805
4825	4822 051 20008	0R Jumper 0805
4826	4822 051 20008	0R Jumper 0805
4827	4822 051 20008	0R Jumper 0805
4828	4822 051 20008	0R Jumper 0805
4829	4822 051 20008	0R Jumper 0805
4830	4822 051 20008	0R Jumper 0805
4831	4822 051 20008	0R Jumper 0805
4832	4822 051 20008	0R Jumper 0805
4833	4822 051 20008	0R Jumper 0805
4835	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	5322 242 73686	Ceramic Resonator
5401	4822 242 70938	X'tal Resonator 32,768kHz
5403	4822 157 62552	Coil 2,2µH 5%
5404	4822 157 62552	Coil 2,2µH 5%
5405	4822 157 52333	Coil 100µH 5%
5406	4822 157 52333	Coil 100µH 5%
5408	4822 157 71593	Coil 10µH 10%
5409	4822 157 71593	Coil 10µH 10%
5410	4822 157 52333	Coil 100µH 5%
5801	4822 157 62552	Coil 2,2µH 5%

DIODES

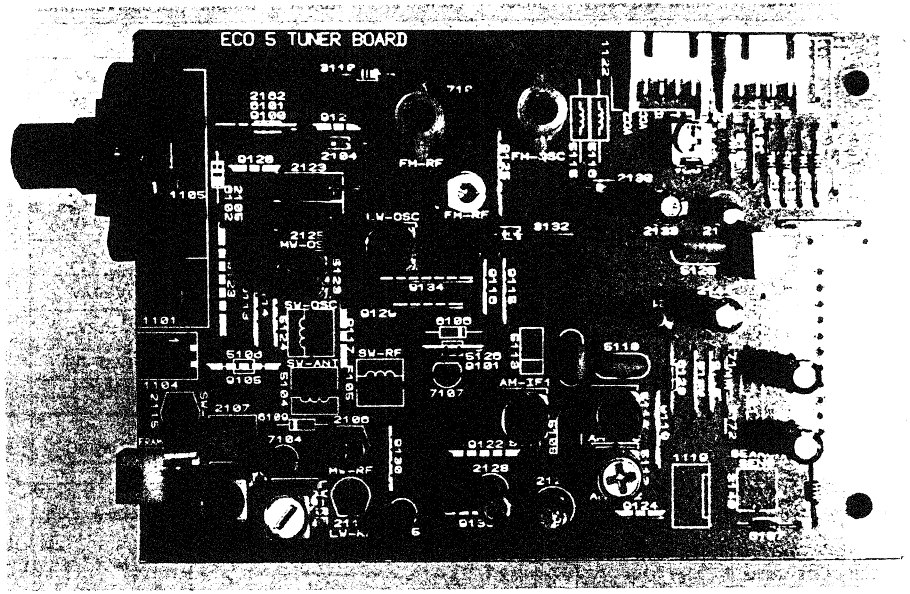
6404	4822 130 31878	1N4003G
6405	4822 130 31878	1N4003G
6406	4822 130 10792	LTL-1CHPE
6420	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6426	4822 130 30621	1N4148
6427	4822 130 31878	1N4003G
6428	4822 130 11589	LTL-1CHAE
6429	4822 130 11589	LTL-1CHAE
6430	4822 130 11589	LTL-1CHAE
6431	4822 130 11589	LTL-1CHAE
6432	4822 130 11589	LTL-1CHAE
6433	4822 130 11589	LTL-1CHAE
6434	4822 130 11589	LTL-1CHAE
6435	4822 130 11589	LTL-1CHAE
6436	4822 130 11589	LTL-1CHAE
6437	4822 130 11589	LTL-1CHAE
6438	4822 130 11589	LTL-1CHAE
6439	4822 130 11589	LTL-1CHAE
6440	4822 130 11589	LTL-1CHAE
6441	4822 130 11589	LTL-1CHAE
6442	4822 130 11589	LTL-1CHAE
6443	4822 130 10792	LTL-1CHPE
6444	4822 130 10792	LTL-1CHPE
6445	4822 130 10792	LTL-1CHPE
6446	4822 130 10792	LTL-1CHPE
6900	4822 130 10791	LTL-1CHGE
6901	4822 130 10791	LTL-1CHGE
6902	4822 130 10791	LTL-1CHGE

ELECTRICAL PARTS LIST - FRONT BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7400	4822 130 60511	BC847B
7401	4822 130 60511	BC847B
7402	4822 130 60511	BC847B
7403	4822 130 60511	BC847B
7404	4822 130 60511	BC847B
7406	4822 130 60511	BC847B
7407	4822 130 60511	BC847B
7408	4822 130 60511	BC847B
7410	4822 130 10165	GP1U28XP
7411	4822 130 60511	BC847B
7412	4822 130 60511	BC847B
7413	4822 209 17387	TMP88CU74YF - '870S51891'
7415	5322 209 11446	HEF4051BT
7416	4822 209 17345	M62320FP
7417	4822 209 31508	ST24C01B6
7418	4822 209 15449	74HC4094D
7419	4822 209 15449	74HC4094D
7423	4822 130 60511	BC847B
7805	4822 130 60511	BC847B
7806	4822 130 60511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.



TUNER BOARD ECO5

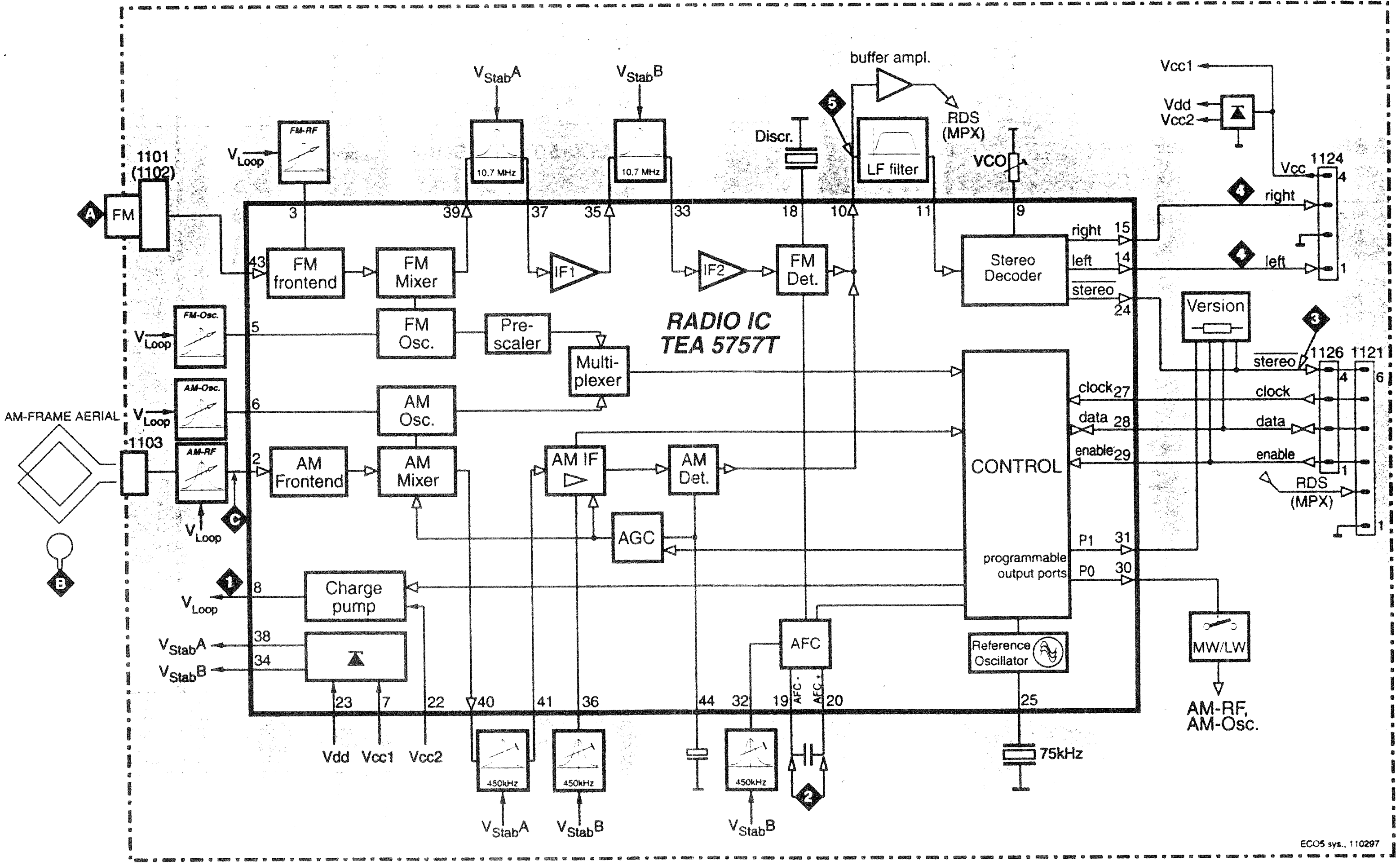
TABLE OF CONTENTS

Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout 7B-2
Circuit diagram 7B-3
Partslist 7B-4

BLOCKDIAGRAM

TUNER BOARD

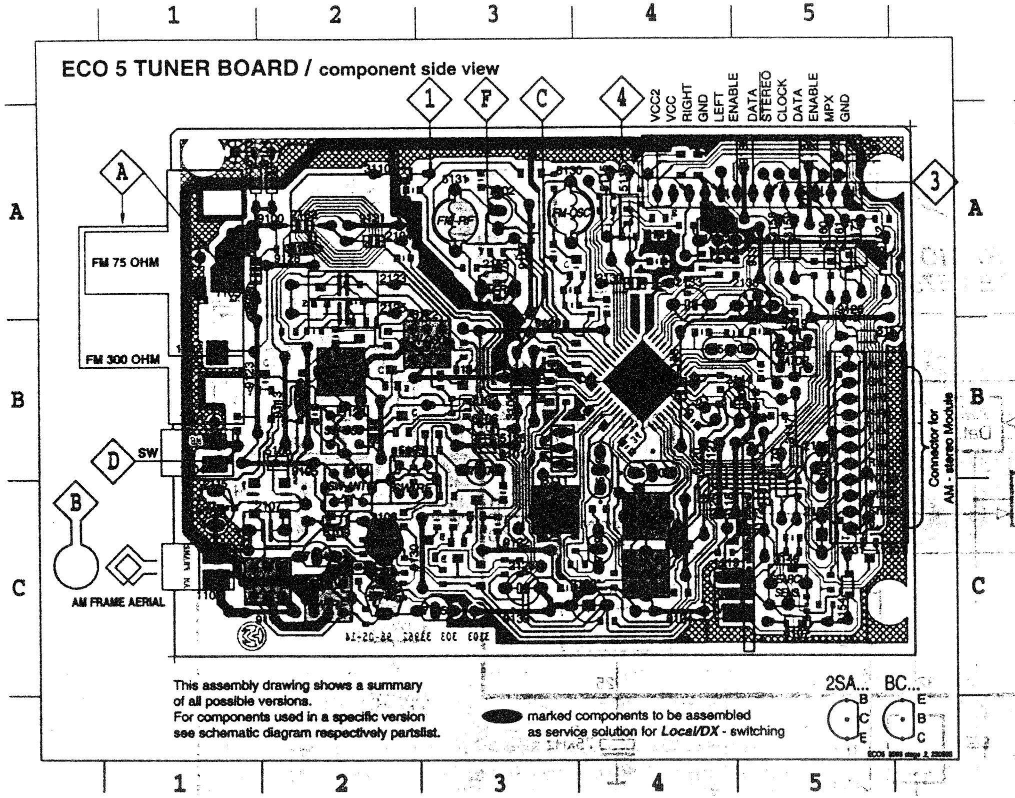
ECO 5 systems


buffer ampl.
RDS
(MPX)
VStabA
VStabB
FM-RF
VLoop
10.7 MHz
Discr.
LF filter
VCO
Vcc1
Vdd
Vcc2
Vcc
1124
1101
(1102)
FM
A
right
left
4
1
3
39
37
35
33
18
10
11
9
5
43
FM frontend
FM Mixer
IF1
IF2
FM Det.
Stereo Decoder
right 15
left 14
stereo 24
Version
FM-Osc.
FM Osc.
Pre-scaler
Multi-plexer
RADIO IC
TEA 5757T
AM-Osc.
AM Osc.
6
AM-FRAME AERIAL
1103
AM-RF
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
CONTROL
stereo
1126
1121
clock 27
data 28
enable 29
RDS
(MPX)
C
B
2
8
Charge pump
programmable output ports
P1 31
P0 30
VLoop
38
34
23
7
22
40
41
36
44
32
19
20
AFC
AFC -
AFC +
Reference Oscillator
25
75kHz
MW/LW
AM-RF,
AM-Osc.
Vdd
Vcc1
Vcc2
450kHz
ECO5 sys., 110297

1101	A1
1102	A1
1103	C1
1104	B1
1105	A1
1119	C5
1120	A5
1130	B5
1131	B5
2104	A2
2105	A1
2106	C2
2107	C2
2110	C2
2115	C1
2123	A2
2125	A2
2128	C3
2129	C4
2130	A4
2133	A4
2135	B5
2137	C5
2138	A5
2144	B5
2148	B4
2155	A3
2162	A2
3105	B3
3110	A2
3132	B3
3142	A4
3147	B5
3149	C5
3152	A5
3154	C5
3157	B5
3158	A5
3159	A5
3160	A5
3161	A5
3170	C5
3171	C5
3172	C5
3173	A5
5102	C2
5103	C2
5104	C2
5105	B2
5106	B2
5109	B4
5110	B4
5111	C3
5112	C4
5113	B3
5114	C4
5115	A4
5116	A4
5119	B5
5120	B4
5121	B4
5122	B3
5123	B2
5124	B2
5126	B3
5127	B4
5130	A3
5131	A3
6101	A2
6102	A1
6103	A1
6104	A2
6106	B3
6107	C5
6109	C2
6120	C4
7102	A3
7104	C2
7105	C3
7107	B3
7119	C4
9100	A2
9101	B3
9105	B2
9111	C2
9113	B2
9114	B2
9115	B3
9117	B2
9118	B4
9119	C4
9120	B4
9121	A2
9122	C3
9123	B1
9124	C4
9125	A3
9126	B5
9128	A2
9129	B3
9130	C3
9131	A5
9133	C3
9134	B3
9136	A5
9137	A5

2101	C4
2102	C4
2103	C3
2108	A4
2109	A4
2111	A2
2112	B5
2113	A4
2114	A4
2116	B3
2117	A3
2118	B4
2119	B4
2120	B4
2122	B3
2124	A5
2126	C2
2127	C2
2131	C2
2132	C1
2134	C1
2136	B1
2139	B2
2141	B1
2142	B1
2143	A1
2145	C1
2146	C1
2147	C1
2149	B2
2150	B2
2151	C2
2152	C3
2153	C3
2154	C3
2156	C4
2157	B4
2158	B4
2159	C2
2160	C4
2161	A3
2163	A2
2164	B1
2165	B3
2166	B2
2167	B2
2168	B1
3101	C3
3102	C3
3103	C3
3104	B3
3106	C4
3108	A4
3109	A4
3111	A3
3112	A3
3113	A2
3114	A3
3115	A3
3116	A3
3117	B4
3118	B3
3119	A3
3120	B4
3121	A3
3122	B3
3123	A3
3125	A3
3126	B3
3127	B3
3128	B3
3133	B4
3134	B4
3136	B4
3137	B4
3140	B2
3141	C2
3143	C2
3144	C2
3145	C2
3146	A1
3148	A1
3153	C2
3155	A2
3156	A1
3167	C2
3168	B3
3169	B2
3175	A2
3176	C2
3177	A1
3178	A1
3179	A1
3180	A4
3181	C3
4101	A4
4102	A4
4103	C2
4104	A2
4105	B3
4106	B4
4107	C4
4108	B4
4109	A3
4110	A3
4111	C1
4120	C2
4150	B2
4151	B3
4152	B3
4153	B4
4154	C3
4155	A4
4156	A2
4157	B3
4158	C2
4159	A2
4160	A1
4161	A1
4162	C1
4163	C1
6105	A4
6110	A4
6111	B4
6130	C2
6131	C3
7101	B2
7103	C2
7106	A3
7108	A3
7109	A3
7111	A1
7120	B4
7121	B3
7122	B4
7123	B4
7124	C4
7125	A1

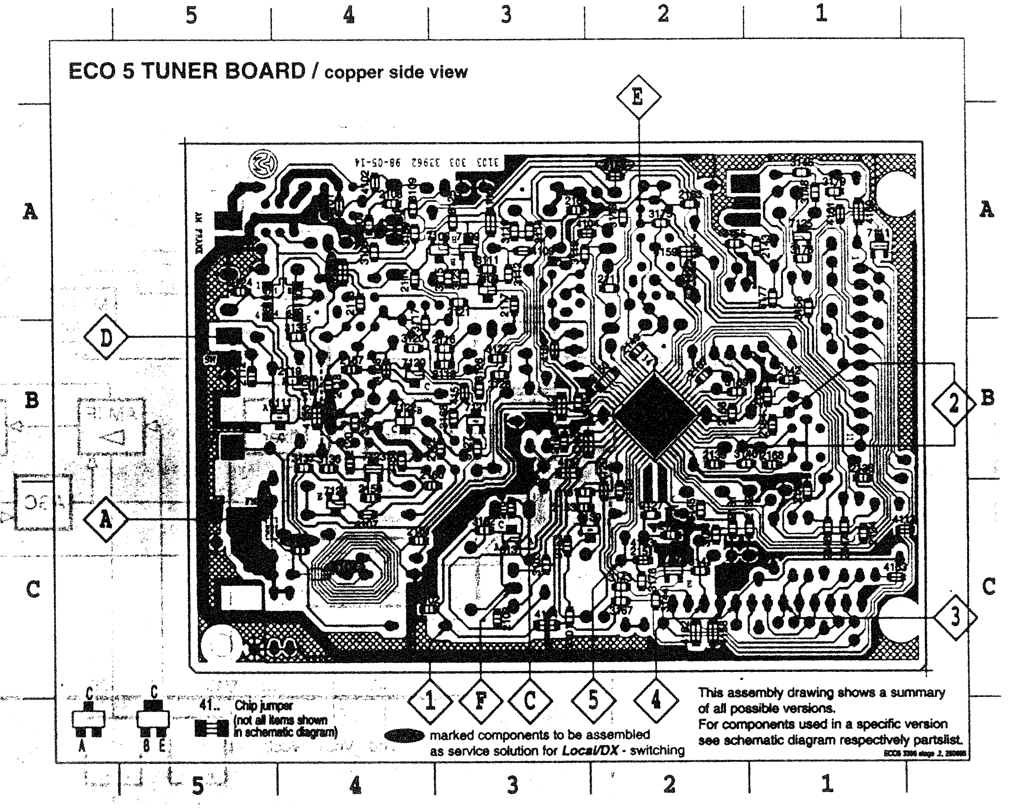
ECO 5 TUNER BOARD / component side view



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for *Local/DX* - switching

ECO 5 TUNER BOARD / copper side view

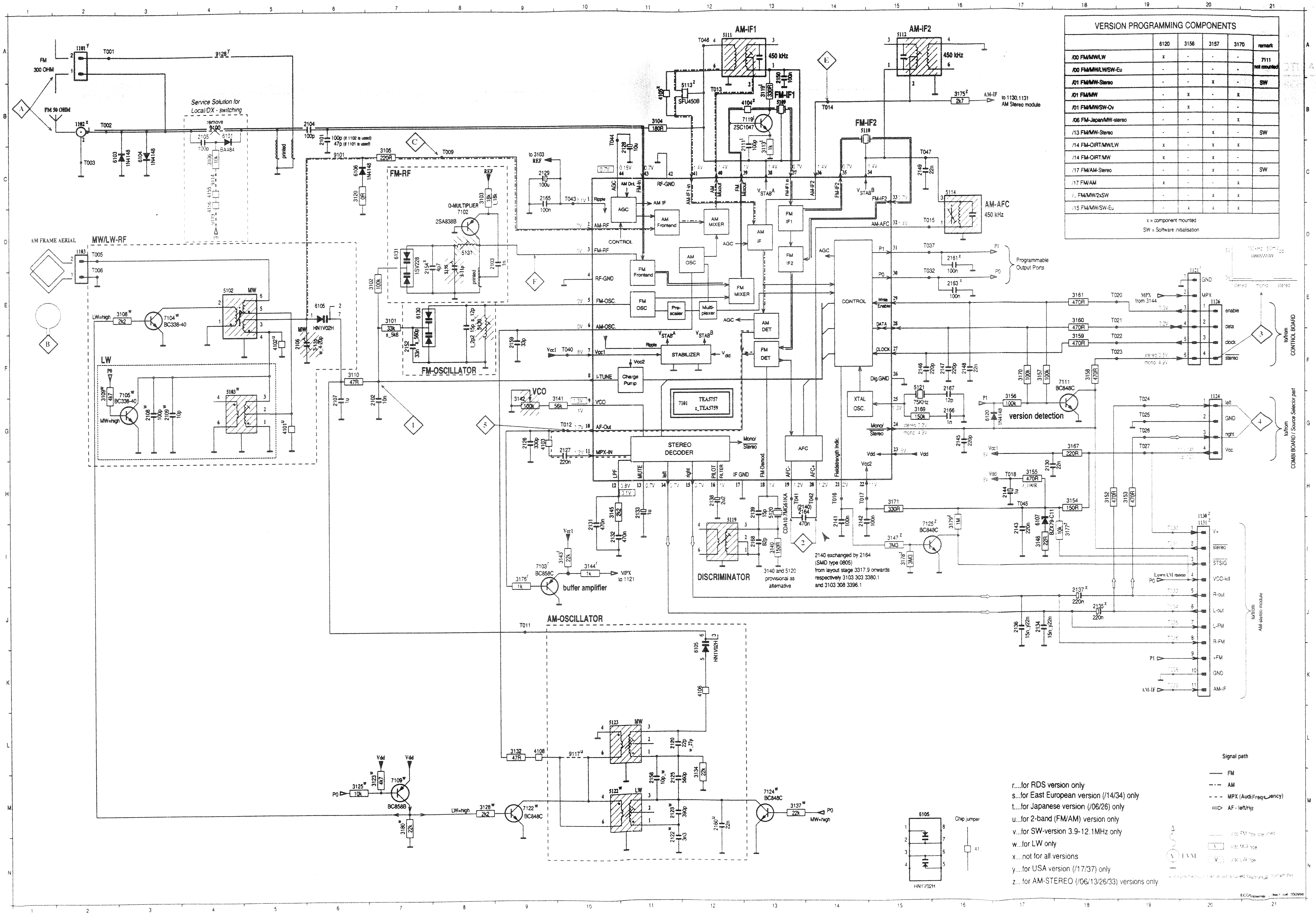


Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for *Local/DX* - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50 OHM
1101
1102
T001
T002
T003
3128
Service Solution for Local/DX - switching
remove 9100
2105 100p
6101 BA484
6103 1N4148
6104 1N4148
2104 100p
2101 100p (if 1102 is used) 47p (if 1101 is used)
printed
9101
3105 220R
6106 1N4148
3120 8R
T009
FM-RF
Q-MULTIPLIER 7102 2SA838B
REF
3103 18k
6131 1SV228
5131
FM-OSCILLATOR
6130
3101 33k
3102 100k
AM FRAME AERIAL
MW/LW-RF
1103
T005
T006
5102 MW
3108 2k2
7104 BC338-40
LW=high
6105 HN1V02H
4102
LW
7105 BC338-40
MW=high
3109 4k7
5103
4101
3110 47R
2107 1u
2102 10n
AM-IF1
5111
450 kHz
T046
5113 SFU450B
4105
T013
FM-IF1
5109
7119 2SC1047
4104
3104 180R
AM-IF2
5112
450 kHz
T014
FM-IF2
5110
3175 2k7
AM-IF to 1130,1131 AM Stereo module
AM-AFC 450 kHz
5114
T015
T047
to 3103 REF
2129 100u
2165 100n
T043
AGC
AM IF
AM Frontend
AM MIXER
AM IF
FM IF1
FM IF2
CONTROL
AM OSC
FM Frontend
FM MIXER
FM OSC
Pre-scaler
Multi-plexer
AM DET
FM DET
STABILIZER
Charge Pump
VCO
3142 100k
3141 56k
7101 TEA5757 z_TEA5759
STEREO DECODER
AFC
XTAL OSC.
5121 75KHz
3169 150k
2167 12p
2166 1n
RF-GND
FM-RF
AM-RF
FM-OSC.
AM-OSC.
Vcc1
I-TUNE
VCC
AF-Out
MPX-IN
LPF
MUTE
left
right
PILOT FILTER
IF GND
FM-Demod.
AFC-
AFC+
Fieldstrength indic.
Vdd
Vcc2
Ripple
P1
P0
Write Enable
DATA
CLOCK
Dig.GND
Mono/Stereo
T037
T032
2161 100n
2163 100n
Programmable Output Ports
T020
T021
T022
T023
3161 470R
3160 470R
3159 470R
MPX from 3144
1121
1126
GND
MPX
enable
data
clock
stereo
to/from CONTROL BOARD
version detection
6120 1N4148
3156 100k
7111 BC848C
3170 100k
3157 100k
3158 470R
1124
T024
T025
T026
T027
left
GND
right
Vcc
to/from COMBI BOARD / Source Selector part
3167 220R
3155 470R
3154 150R
3171 330R
7125 BC848C
3147 3M3
6107 BZX79-C11
3152 470R
3153 470R
1130
1131
V+
stereo
STSIG
VCC-kill
R-out
L-out
L-FM
R-FM
+FM
GND
AM-IF
Low=AM mono
2137 220n
2135 220n
to/from AM stereo module
5119
DISCRIMINATOR
5120 CDA10.7MG61KA
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
3140 and 5120 provisional as alternative
7103 BC858C
buffer amplifier
3143 22k
3144 1k
MPX to 1121
3176 1k
AM-OSCILLATOR
T011
6105 HN1V02H
4106
5123 MW
5122 LW
3132 47R
4108
9117
3134 22k
7109 BC858B
3123 4k7
3125 10k
3180 22k
3128 2k2
LW=high
7122 BC848C
7124 BC848C
3137 22k
MW=high
6105 HN1V02H
Chip jumper
Signal path
FM
AM
MPX (AudioFrequency)
AF - left/right
EVM
Vdc FM mode stereo
Vdc MW mode
Vdc LW mode
voltages measured while set is tuned to strong transmitter
ECO5ystems – descr coll. 030998

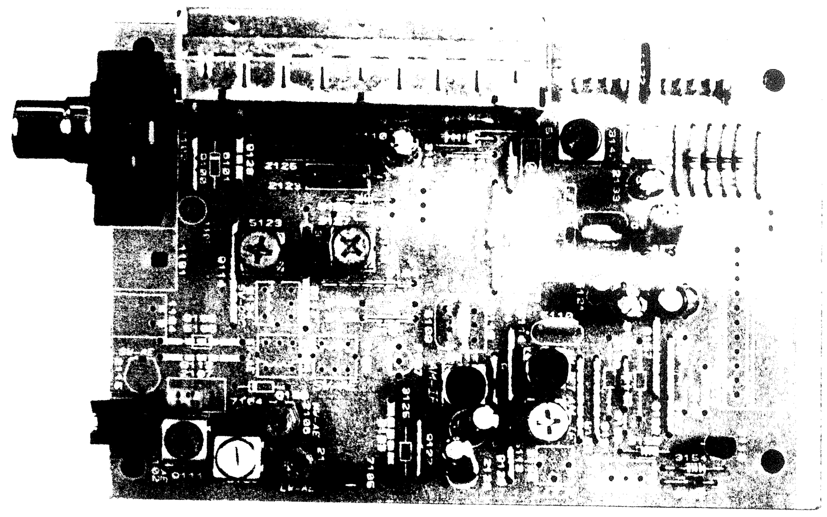
VERSION PROGRAMMING COMPONENTS	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted

SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

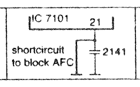
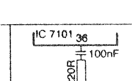
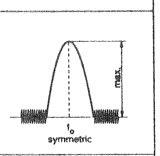
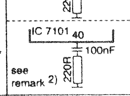
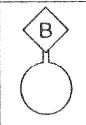
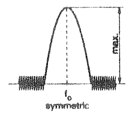


TUNER 95 BOARD

TABLE OF CONTENTS

Blockdiagram 7D-1
Adjustmant table 7D-2
Component layout 7D-2
Circuit diagram 7D-3
Partslist 7D-4

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇ 1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW			279kHz	5122		8V ±0.2V
153 - 279kHz			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	◇ F	 IC 7101 21 shortcircuit to block AFC 2141	5119	◇ 2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇ A	108MHz	2155	◇ 4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇ A	98MHz	3142	◇ 3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇ C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	◇ 4	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC MW		◇ C continuous wave V_{RF} = 10mV		5114	◇ 2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇ B 	1494kHz	2106	◇ 4	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, discr. osil. 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For **AM RF adjustments the original** frame antenna has to be used !

[4] MW has to be aligned before LW.

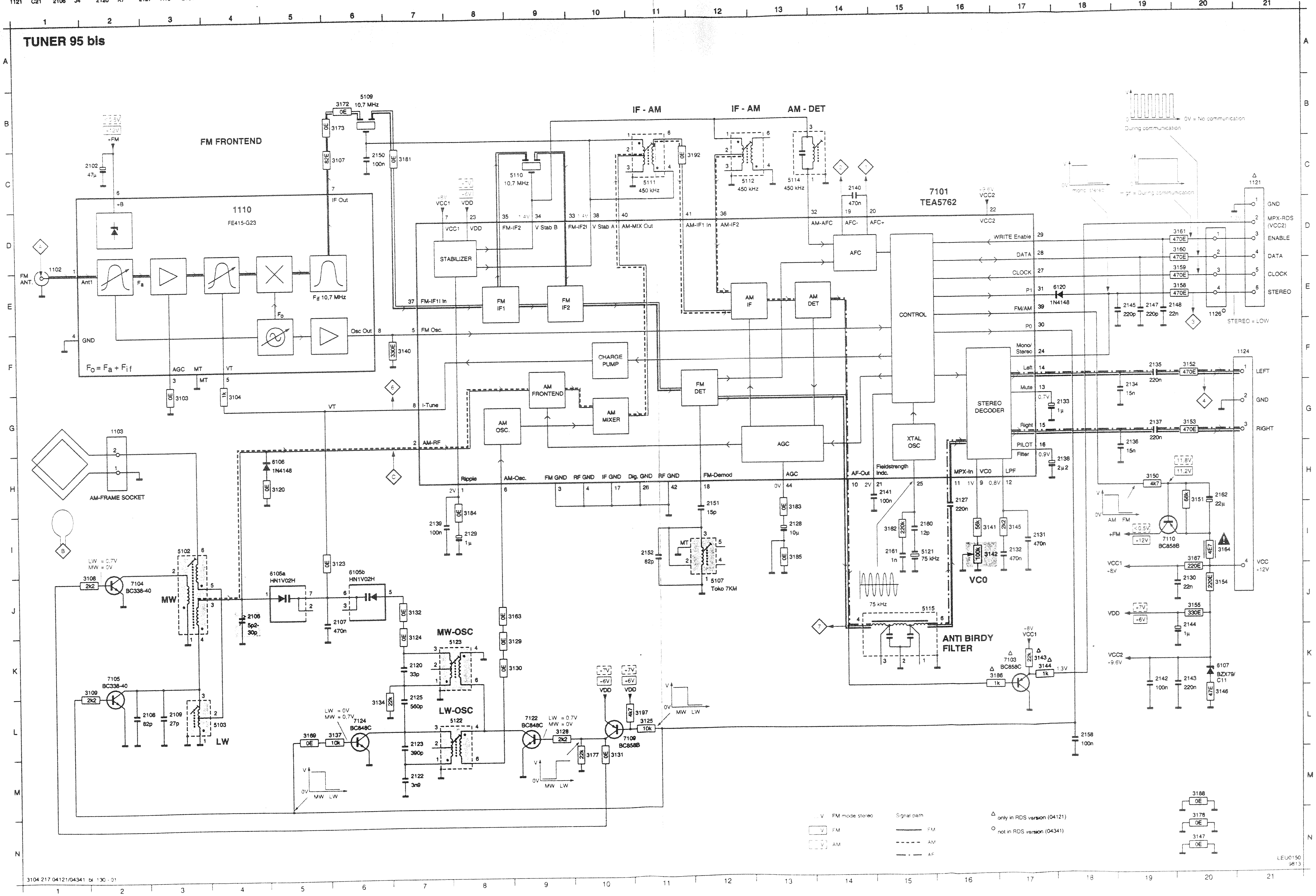
↕ Repeat

1102	D1	1124	F21	2107	J6	2122	M7	2128	I13	2132	I17	2136	H19	2140	C14	2144	K20	2150	C6
1103	G2	1126	E20	2108	L2	2123	L7	2129	I8	2133	G18	2137	G19	2141	H15	2145	E19	2151	H12
1110	D4	2102	C2	2109	L3	2125	L7	2130	J20	2134	G19	2138	H18	2142	K19	2147	E19	2152	I11
1121	C21	2106	J4	2120	K7	2127	H16	2131	I17	2135	F19	2139	I7	2143	K20	2148	E19	2158	L18

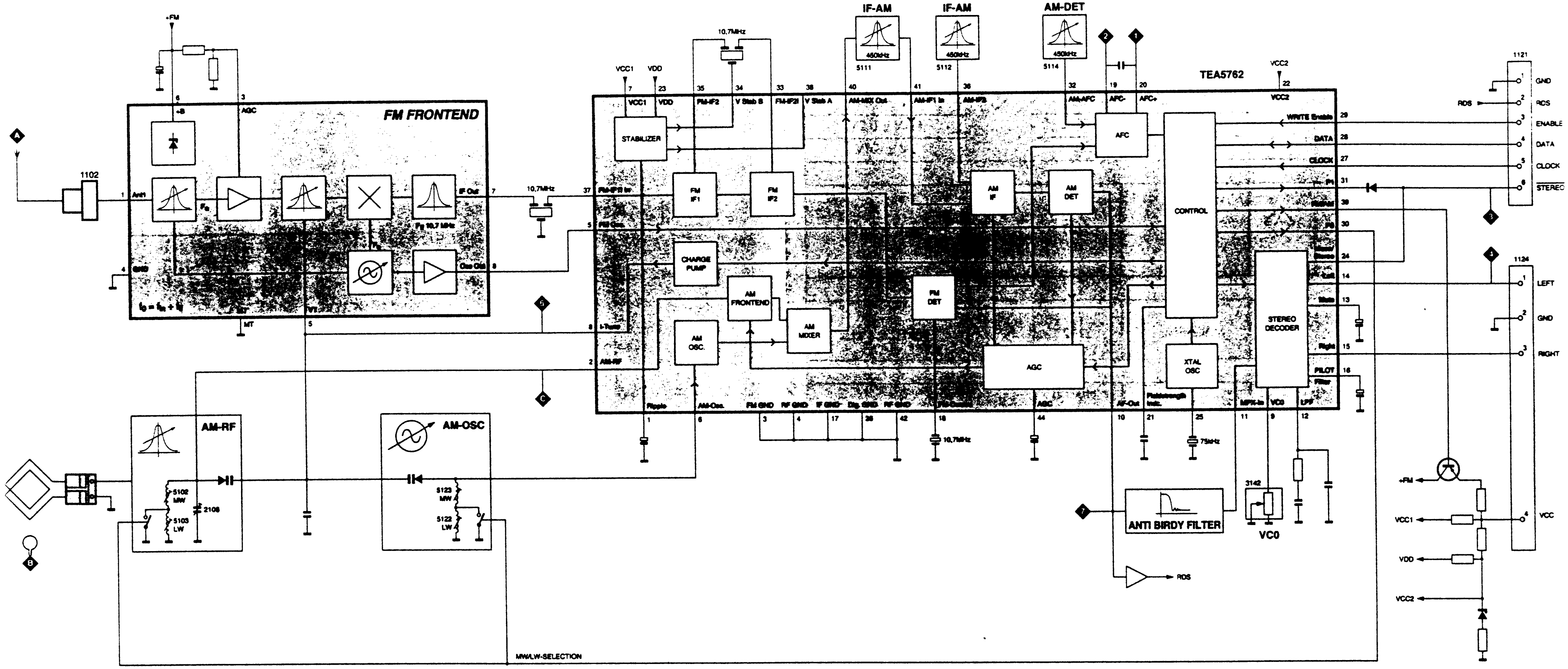
2160	I15	3104	G4	3120	H5	3128	L9	3132	J7	3141	I16	3145	I17	3151	I20	3155	J20	3161	D19
2161	I15	3107	C6	3123	I6	3129	K8	3134	L6	3142	I16	3146	L20	3152	F20	3158	E19	3162	I15
2162	H20	3108	J1	3124	K7	3130	K8	3137	L5	3143	K17	3147	N20	3153	G20	3159	E19	3163	J8
3103	G3	3109	K1	3125	L11	3131	M10	3140	F7	3144	K17	3150	H19	3154	J20	3160	D19	3164	I20

3167	I20	3177	M10	3184	I8	3192	C12	5107	J12	5112	C12	5122	L7	6106	H5	7103	K17	7110	I19
3169	L5	3178	N20	3185	I13	3197	L11	5109	B6	5114	C13	5123	K7	6107	K20	7104	J2	7122	L9
3172	B6	3181	C7	3186	K16	5102	I3	5110	C9	5115	J15	6105a	I5	6120	E17	7105	K2	7124	L6
3173	B6	3183	I13	3188	M20	5103	L4	5111	C11	5121	I15	6105b	I6	7101	C15	7109	L10		

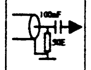
TUNER 95 bis


FM FRONTEND
1110
FE415-G23
FM ANT.
1102
Ant1
GND
Fa
Fif 10,7 MHz
Fo
Fo = Fa + Fif
IF Out
Osc Out
AGC
MT
VT
+B
+FM
2102
47µ
3103
0E
3104
1k
5109
10,7 MHz
3172
3173
3107
82E
3181
2150
100n
5110
10,7 MHz
3140
330E
IF - AM
IF - AM
AM - DET
5111
450 kHz
5112
450 kHz
5114
450 kHz
3192
2140
470n
7101
TEA5762
VCC1
VDD
VCC2
STABILIZER
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
AFC
CONTROL
FM-IF1 In
FM IF1
FM IF2
AM IF
AM DET
FM Osc.
I-Tune
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
6120
1N4148
3161 470E
3160 470E
3159 470E
3158 470E
1126
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
0V = No communication
During communication
1124
LEFT
GND
RIGHT
VCC +12V
2135 220n
3152 470E
2137 220n
3153 470E
2134 15n
2136 15n
2133 1µ
2138 2µ2
2145 220p
2147 220p
2148 22n
3150 4k7
3151 68k
2162 22µ
7110 BC858B
3164 4E7
3167 220E
3154 220E
2130 22n
3155 330E
2144 1µ
VCC1 -8V
VDD
VCC2 +9.6V
2142 100n
2143 220n
6107 BZX79/ C11
3146 47E
2158 100n
1103
AM-FRAME SOCKET
6106 1N4148
3120 0E
2139 100n
3184 0E
2129 1µ
2151 15p
2152 82p
5107 Toko 7KM
3183 0E
2128 10µ
3185 0E
2141 100n
3162 220k
2160 12p
2161 1n
5121 75 kHz
2127 220n
3141 56k
3142 100k
3145 2k2
2132 470n
2131 470n
VCO
75 kHz
5115
ANTI BIRDY FILTER
7103 BC858C
3143 22k
3144 1k
3186 1k
7104 BC338-40
3108 2k2
5102
MW
2106 5p2- 30p
6105a HN1V02H
6105b HN1V02H
3123 0E
2107 470n
3132 0E
3124 0E
MW-OSC
5123
2120 33p
2125 560p
3134 22k
LW-OSC
5122
2123 390p
2122 3n9
7105 BC338-40
3109 2k2
2108 82p
2109 27p
5103
LW
3169 0E
3137 10k
7124 BC848C
3163 0E
3129 0E
3130 0E
7122 BC848C
3128 2k2
3177 22k
3131 0E
7109 BC858B
3197 4k7
3125 10k
LW = 0.7V MW = 0V
LW = 0V MW = 0.7V
MW LW
V FM mode stereo
Signal path
FM
AM
AF
only in RDS version (04121)
not in RDS version (04341)
3188 0E
3178 0E
3147 0E
3104 217 04121/04341 bl 130 - 01
LEU0150 9813

BLOCKDIAGRAM


+FM
6
+B
3
AGC
FM FRONTEND
A
1102
1 Ant1
F0
F0 10,7 MHz
IF Out 7
Osc Out 8
4 GND
f0 = fin + fi
MT
VT 5
10,7MHz
5
8
2
C
AM-RF
5102 MW
5103 LW
2108
AM-OSC
5123 MW
5122 LW
B
MW/LW-SELECTION
10,7MHz
VCC1
VDD
IF-AM
450kHz
5111
IF-AM
450kHz
5112
AM-DET
450kHz
5114
2
1
TEA5762
VCC2
7 VCC1
23 VDD
35 FM-IF2
34 V Stab B
33 FM-IF2I
38 V Stab A
40 AM-MIX Out
41 AM-IF1 In
36 AM-IF2
32 AM-AFC
19 AFC-
20 AFC+
22 VCC2
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
37 FM-IF1 In
5 FM Osc.
8 I-Tune
2 AM-RF
WRITE Enable 29
DATA 28
CLOCK 27
PI 31
RDS/AM 39
FS 30
Mono/Stereo 24
AF-Left 14
Mute 13
Right 15
PILOT Filter 16
1 Ripple
6 AM-Osc.
3 FM GND
4 RF GND
17 IF GND
26 Dig. GND
42 RF GND
18
44 AGC
10 AF-Out
21 Fieldstrength Indic.
25
11 MPX-In
9 VC0
12 LPF
10,7MHz
75kHz
3
4
1121
1 GND
RDS
2 RDS
3 ENABLE
4 DATA
5 CLOCK
6 STEREO
1124
1 LEFT
2 GND
3 RIGHT
4 VCC
+FM
VCC1
VDD
VCC2
7
ANTI BIRDY FILTER
3142
VC0
RDS

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM - DETECTION						
FM	98 MHz 1mV continuous wave ***short pin 21 (IC7101) to ground***	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM - VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM - IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	 ◇C	MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave			5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0.5W	
3159	4822 116 83883	470R 5% 0.5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0.5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0.1W	
3170	4822 116 52234	100k 5% 0.5W	
3171	4822 116 52219	330R 5% 0,5W	
3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0.5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478	△ 4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial

5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHZ
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note : Only the parts mentioned in this list are normal service spare parts.

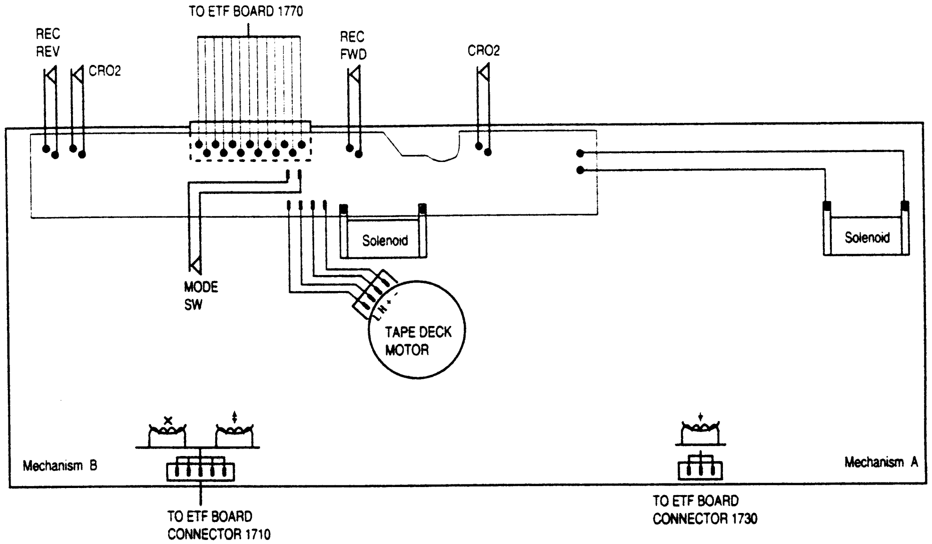
ETF6-FE TAPE MODULE

(Non-Dolby Version)

TABLE OF CONTENTS

Tape Module Wiring & variation table 9-1
Block diagram 9-2
Brief Introduction 9-3
Connector assignment.. 9-4
Tape deck electronics & Tape adjustments 9-5
ETF6-FE Non-dolby board layouts............................ 9-6
Analog Circuit diagram 9-7
Servo Circuit diagram 9-8
Exploded views & parts list.. 9-9
Electrical parts list... 9-13

Tapedeck wiring (Double deck)



TO ETF BOARD 1770
REC REV
CRO2
REC FWD
CRO2
Solenoid
Solenoid
MODE SW
TAPE DECK MOTOR
Mechanism B
Mechanism A
TO ETF BOARD CONNECTOR 1710
TO ETF BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

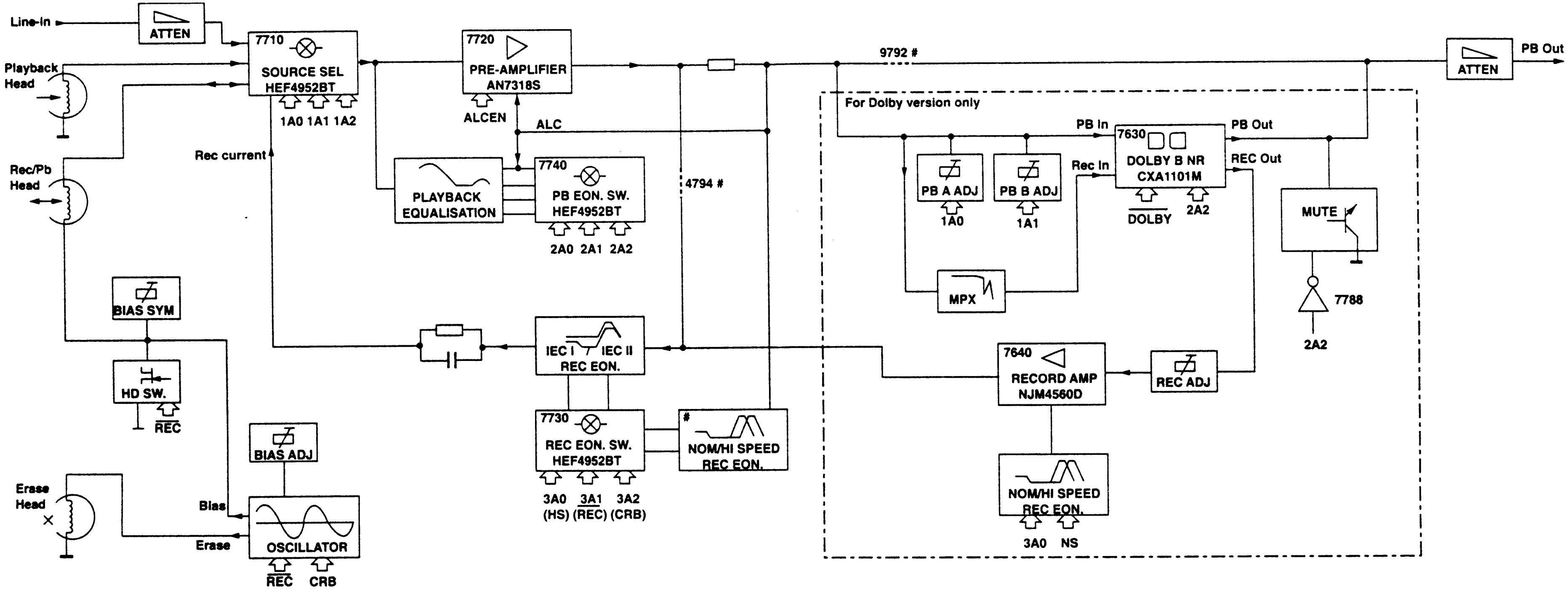
MODULE	ETF6-FE	
VARIANT	1	2
NAME	ND/DD/FR	ND/DD/FF
Deck configuration	double	double
Autoreverse	yes (B)	no
Auto-replay	no	yes (B)
Motor configuration	single	single
Auto tape type selection	yes	yes
Dolby B type Noise Reduction	no	no
19 kHz pilot suppression	no	no
High speed dubbing	yes	yes

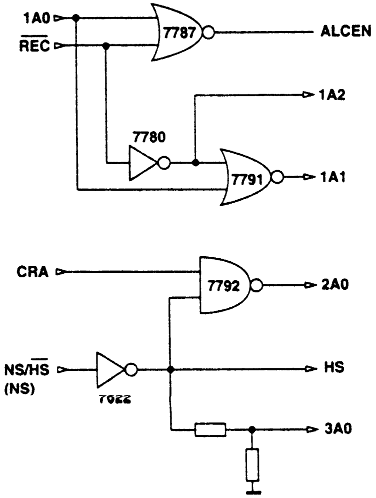
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

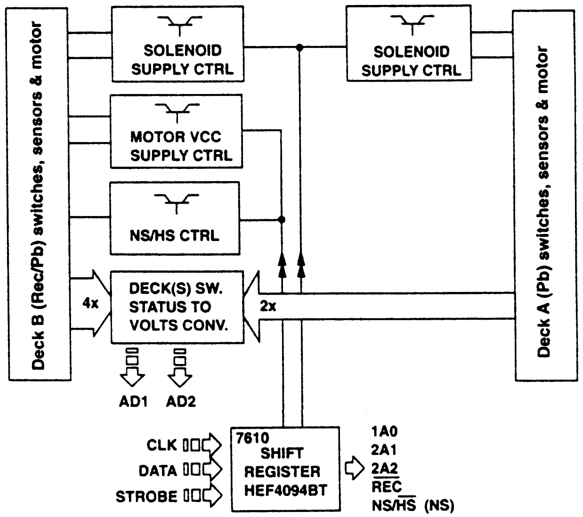
Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
1760	-	-
1770	use	use
3723	12k	15k
3724	12k	15k
3743	1k2	1k
3744	1k2	1k
3769	12k	8k2
3772	4k7	5k6
3774	10k	8k2

BLOCK DIAGRAM


Line-in
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710 SOURCE SEL HEF4952BT
1A0 1A1 1A2
Rec current
7720 PRE-AMPLIFIER AN7318S
ALCEN
ALC
PLAYBACK EQUALISATION
7740 PB EQN. SW. HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
BIAS SYM
HD SW.
REC
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB
IEC I IEC II REC EQN.
7730 REC EQN. SW. HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED REC EQN.
For Dolby version only
PB In
7630 DOLBY B NR CXA1101M
PB Out
Rec In
REC Out
DOLBY 2A2
PB A ADJ
1A0
PB B ADJ
1A1
MPX
7640 RECORD AMP NJM4560D
REC ADJ
NOM/HI SPEED REC EQN.
3A0 NS
MUTE
7788
2A2
ATTEN
PB Out


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7022
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
DECK(S) SW. STATUS TO VOLTS CONV.
4x
2x
AD1 AD2
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
CLK
DATA
STROBE
7610 SHIFT REGISTER HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701. For Dolby sets the signal from IC7740 will pass through IC7630 (CXA1551M) for dolby noise processing before going to the connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B. For Dolby sets the amplified wll pass through IC7630 (CXA1551M) for dolby noise processing, amplified to the right level by IC7640 (NJM4560M) before record equalization.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762, 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

14. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

15. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

16. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

17. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

18. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

19. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) in
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON *(For ETF6... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON *(For ETF5... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740 — DECK B CONTROL INTERFACE *(For ETF5... Double Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	H	H pin for motor	
○	10	L	L pin for motor	

CONNECTOR 1750 — DECK A CONTROL INTERFAC *(For ETF5... Double Deck only)*

○	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	2	PHOTO A	Photo sensor output (tape movement indication)	
○	3	SOL A	Solenoid supply	
○	4	Vcc	Deck/Motor supply	
○	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	6	GND M	Deck/Motor ground	

CONNECTOR 1760 — DECK B CONTROL INTERFACE *(For Single Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	

CONNECTOR 1770 — DECK A & B CONTROL INTERFACE *(For ETF6... only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	L	L pin for motor	
○	10	H	H pin for motor	
○	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	12	SOL A	Solenoid supply for deck A	
○	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM ELECTRONICS

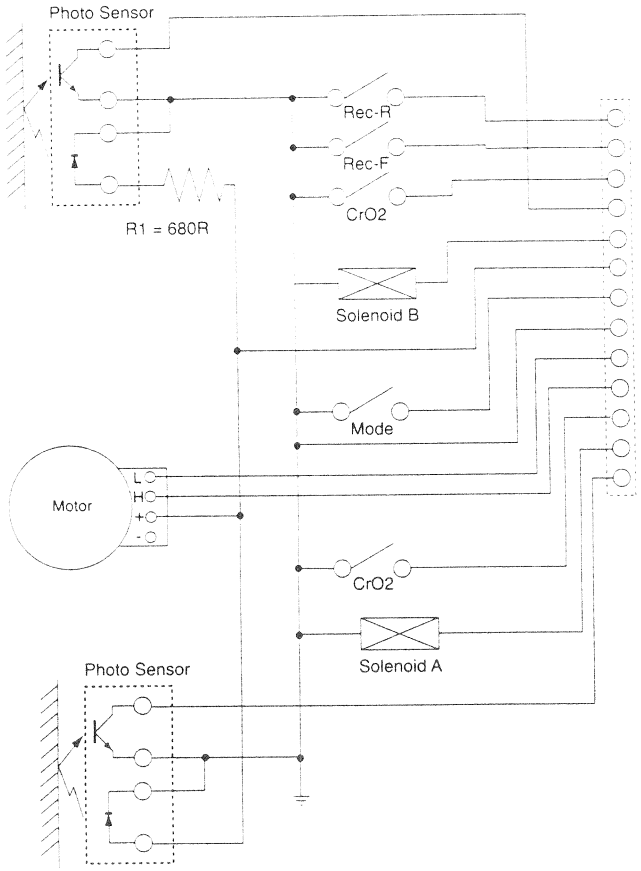
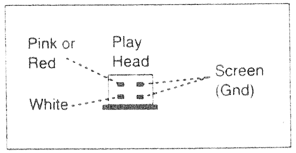
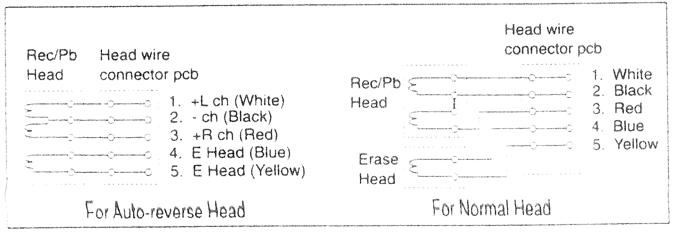


Photo Sensor
R1 = 680R
Rec-R
Rec-F
CrO2
Solenoid B
Mode
Motor
L
H
+
-
CrO2
Solenoid A
Photo Sensor
1. B Rec Switch (REV)
2. B Rec Switch (FWD)
3. B CrO2 Switch
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. Motor L
10. Motor H
11. A CrO2 Switch
12. A Solenoid
13. A Photo Out

Mechanism A Head Wires Soldering


Pink or Red
Play Head
Screen (Gnd)
White

Mechanism B Head Wires Soldering


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)
For Auto-reverse Head
Head wire connector pcb
Rec/Pb Head
Erase Head
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure

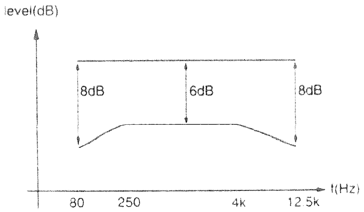


figure. 1

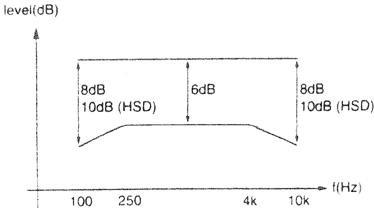
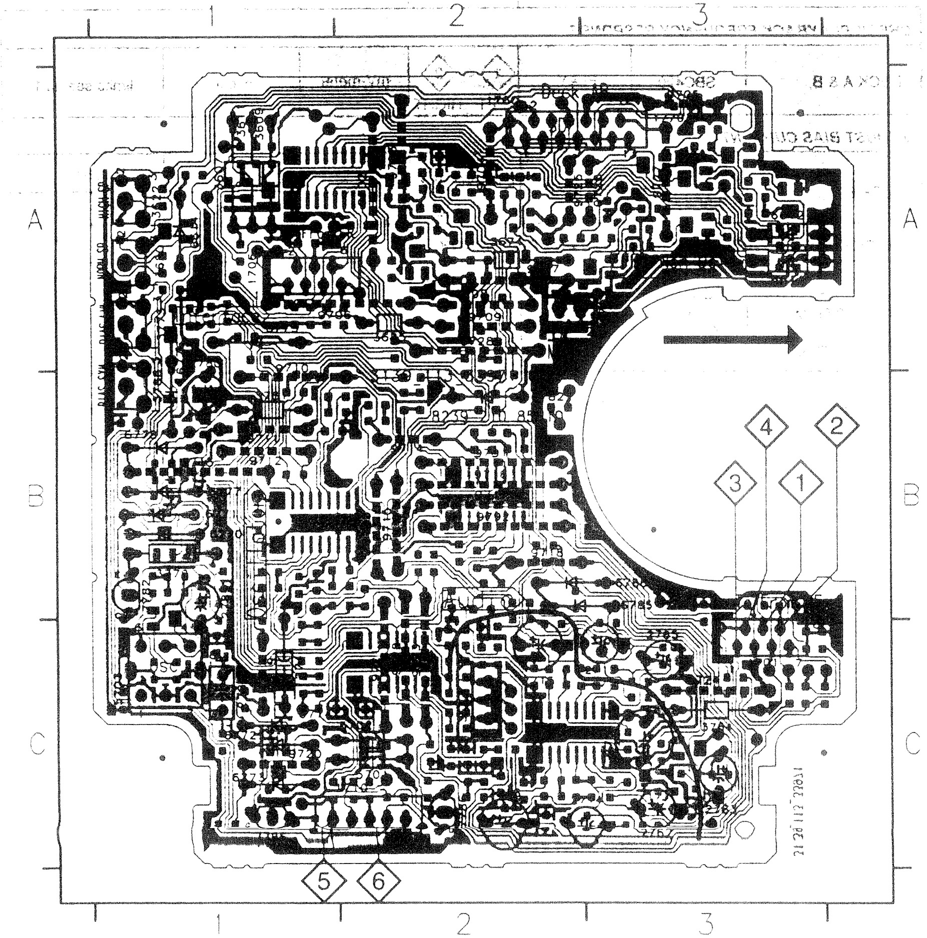


figure. 2

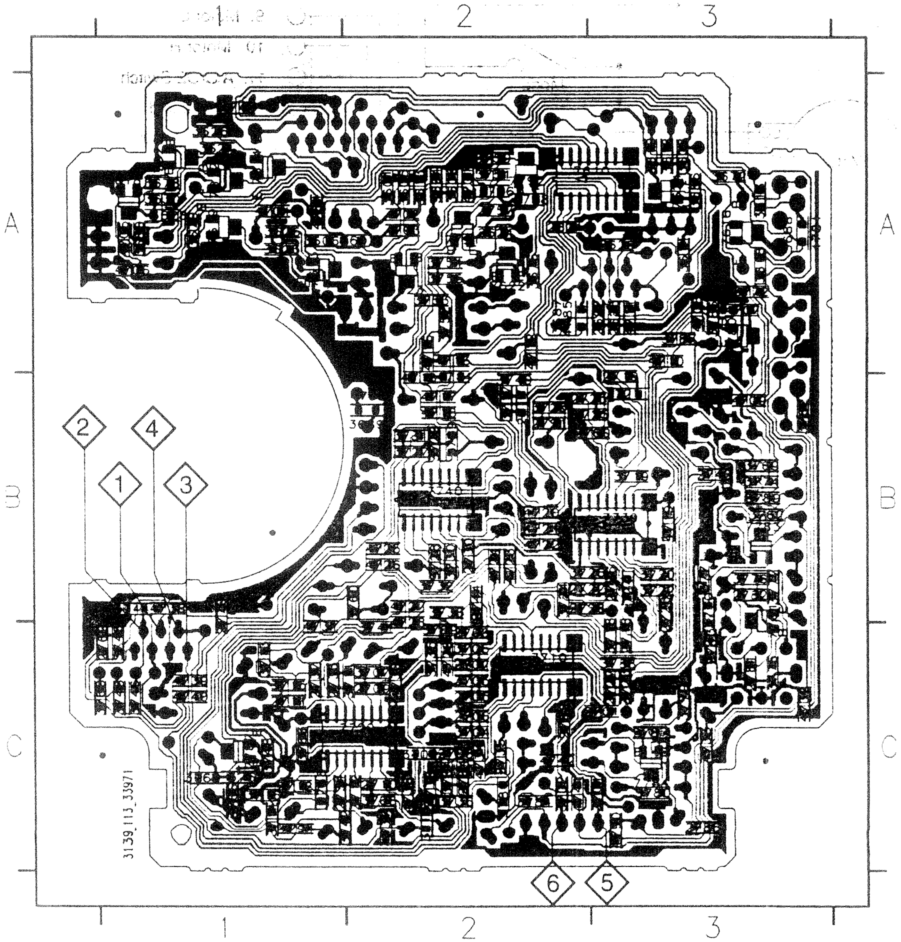
COMPONENT LAYOUT

1701	C3	2716	C2	3609	A1	3785	B1	6773	C1	7785	C1	9710	A1	9720	C1	9792	B2
1703	A3	2741	C1	3611	A1	5701	C2	6774	C1	7786	C2	9711	B1	9721	C2	9793	B2
1706	A1	2761	C3	3620	A1	5702	C2	6775	A1	9702	A2	9712	B1	9722	C2		
1710	C2	2762	C3	3622	A1	5703	C1	6776	A1	9703	A2	9713	B1	9723	C2		
1730	C2	2763	C3	3674	A2	6611	A3	6777	B1	9704	A2	9714	B2	9724	C3		
1760	A2	2765	C3	3685	A2	6612	A3	6778	B1	9705	A3	9715	B2	9725	A2		
1770	A3	2780	A1	3761	B1	6614	A1	6782	B2	9706	A1	9716	B2	9726	A3		
2713	C3	2784	C1	3764	C3	6770	B1	6785	B3	9707	A2	9717	B2	9727	A3		
2714	C3	2785	B1	3773	A1	6771	B1	6786	B3	9708	A2	9718	B2	9728	A2		
2715	C2	3607	A1	3778	B1	6772	C1	7782	B1	9709	A2	9719	C1	9791	B2		

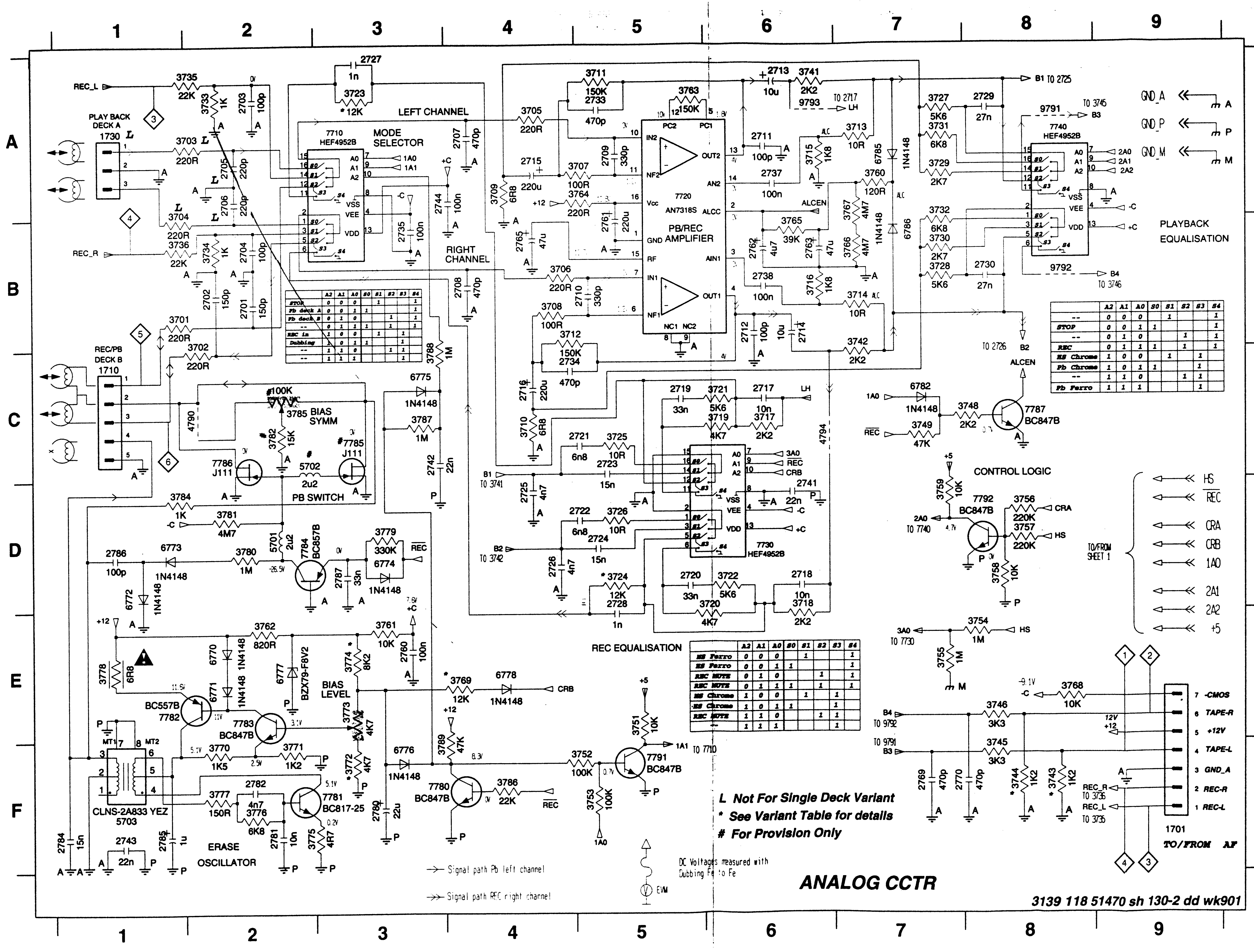


CHIP LAYOUT

2621	A2	2725	B3	3605	A2	3702	C2	3727	B2	3758	A2	3789	B3	4725	B2	7610	A3
2622	A3	2726	B3	3606	A1	3703	C2	3728	B2	3759	A2	4701	A2	4726	B2	7612	A1
2623	A3	2727	C3	3608	A3	3704	C2	3729	B2	3760	B2	4702	A2	4727	B2	7613	A1
2624	A2	2728	B2	3610	A3	3705	C2	3730	B2	3762	B3	4703	A2	4728	C2	7614	A1
2625	A3	2729	B2	3612	A3	3706	C2	3731	B2	3763	C1	4704	A1	4729	C2	7616	A3
2701	C3	2730	B2	3613	A2	3707	C2	3732	B2	3765	C1	4705	A1	4730	C2	7618	A1
2702	C2	2733	C1	3614	A3	3708	C2	3733	B2	3766	C1	4706	A1	4731	C1	7619	A1
2703	C2	2734	C1	3616	A3	3709	C2	3734	C2	3767	C1	4707	A3	4732	C3	7620	A1
2704	C2	2735	C2	3618	A3	3710	C2	3735	C2	3768	C1	4708	A3	4733	C3	7622	A2
2705	C2	2737	C1	3623	A1	3711	C2	3736	C2	3769	B3	4709	B3	4734	C2	7623	A2
2706	C2	2738	C1	3624	A1	3712	C2	3741	C2	3770	B3	4710	A3	4735	C2	7624	A3
2707	C2	2742	B3	3625	A1	3713	C1	3742	C1	3771	B3	4711	A3	4736	C2	7710	C2
2708	C2	2743	C3	3626	A1	3714	C1	3743	C1	3772	A3	4712	A2	4737	C2	7720	C2
2709	C2	2744	B2	3628	A1	3715	C1	3744	B1	3774	B3	4713	A2	4738	B1	7730	B3
2710	C2	2760	B3	3630	A1	3716	C1	3745	C1	3775	C3	4714	B2	4739	C1	7740	B2
2711	C1	2769	C1	3672	A3	3717	B2	3746	C1	3776	B3	4715	A2	4740	C1	7780	A3
2712	C1	2770	B1	3676	A2	3718	C3	3748	C1	3777	B3	4716	B2	4741	C2	7781	B3
2717	B2	2781	C3	3678	A1	3719	B3	3749	B2	3779	C3	4717	B2	4742	C2	7783	B3
2718	C3	2782	B3	3679	A1	3720	B3	3751	A2	3780	C3	4718	B2	4743	A1	7784	C3
2719	B3	2786	C3	3680	A1	3721	B3	3752	A2	3781	C2	4719	B3	4781	A3	7787	C1
2720	B3	2787	C3	3686	A3	3722	B3	3753	A2	3782	B3	4720	B2	4784	A1	7791	A2
2721	B2	3601	A2	3687	A2	3723	C3	3754	A2	3784	C2	4721	B2	4785	A2	7792	A2
2722	B2	3602	A2	3688	A3	3724	B2	3755	A2	3786	A3	4722	B2	4790	C3		
2723	B2	3603	A2	3689	B2	3725	B2	3756	A2	3787	A3	4723	B2	4794	C1		
2724	B3	3604	A2	3701	C3	3726	B2	3757	A2	3788	C3	4724	B2	4795	B2		



ANALOG CIRCUIT


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1710
LEFT CHANNEL
RIGHT CHANNEL
7710
HEF4952B
MODE SELECTOR
7720
AN7318S
PB/REC AMPLIFIER
7740
HEF4952B
PLAYBACK EQUALISATION
7730
HEF4952B
REC EQUALISATION
CONTROL LOGIC
BIAS SYMM
PB SWITCH
BIAS LEVEL
ERASE OSCILLATOR
CLNS-2A833 YEZ
5703
GND_A
GND_P
GND_M
TO/FROM SHEET 1
HS
REC
CRA
CRB
1A0
2A1
2A2
+5
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
1701
TO/FROM AF
Signal path Pb left channel
Signal path REC right channel
DC Voltages measured with Dubbing Fe to Fe
EVM

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
HS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For Single Deck Variant

**** See Variant Table for details***

# For Provision Only

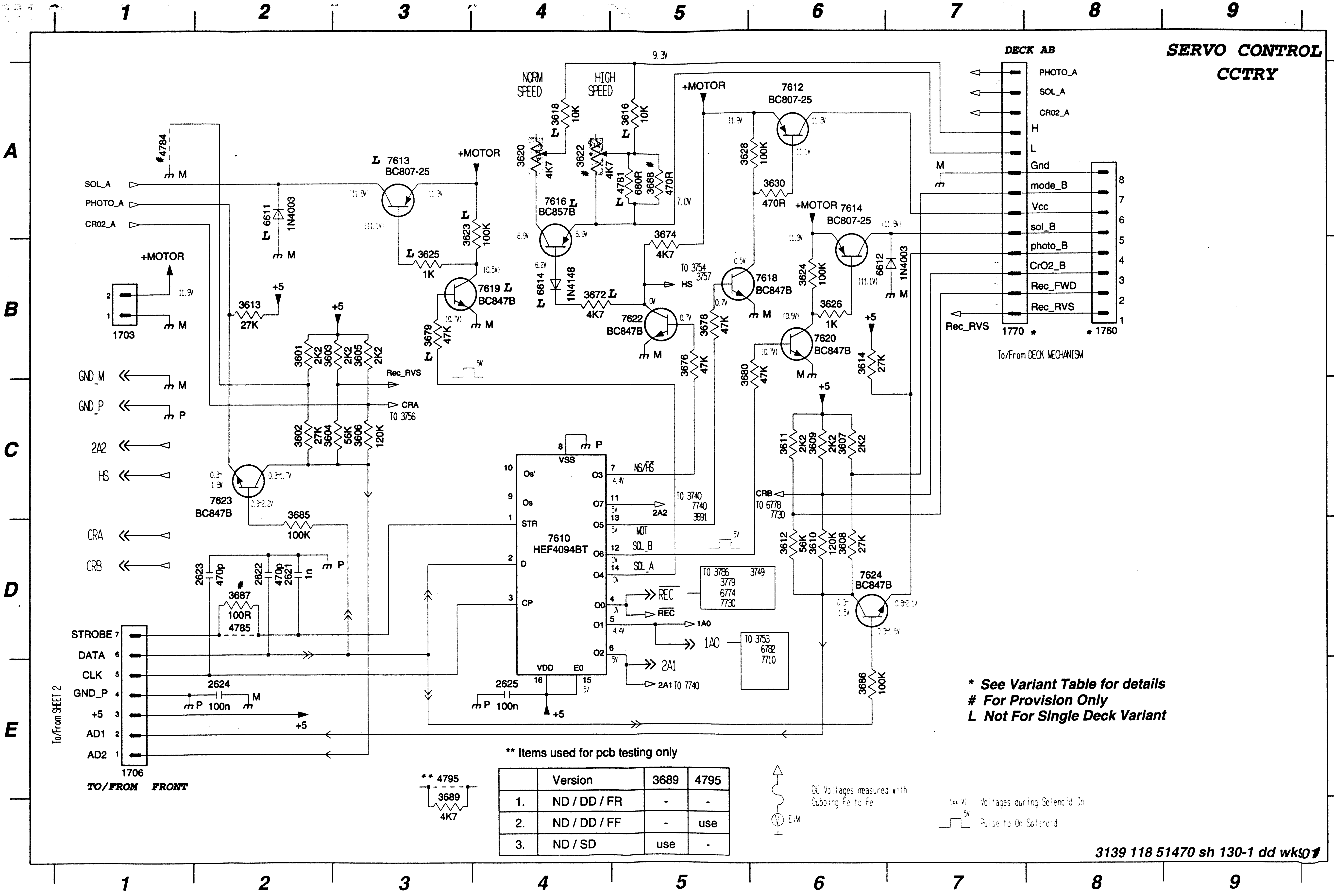
ANALOG CCTR

3139 118 51470 sh 130-2 dd wk901

1701	F9
1710	C1
1730	A1
2701	B2
2702	B2
2703	A2
2704	B2
2705	A2
2706	A2
2707	A4
2708	B4
2709	A5
2710	B5
2711	A6
2712	B6
2713	A6
2714	B6
2715	A4
2716	C4
2717	C6
2718	D6
2719	C5
2720	D5
2721	C5
2722	D5
2723	C5
2724	D5
2725	D4
2726	D4
2727	A3
2728	D5
2729	A8
2730	B8
2733	A5
2734	C4
2735	B3
2737	A6
2738	B6
2741	D6
2742	C3
2743	F1
2744	A3
2760	E3
2761	B5
2762	B6
2763	B6
2765	B4
2769	F7
2770	F7
2780	F3
2781	F2
2782	F2
2784	F1
2785	F1
2786	D1
2787	D3
3701	B1
3702	B2
3703	A2
3704	A1
3705	A4
3706	B4
3707	A5
3708	B4
3709	A4
3710	C4
3711	A5
3712	B4
3713	A7
3714	B7
3715	A6
3716	B6
3717	C6
3718	D6
3719	C6
3720	D6
3721	C6
3722	D6
3723	A3
3724	D5
3725	C5
3726	D5
3727	A7
3728	B7
3729	A7
3730	B7
3731	A7
3732	A7
3733	A2
3734	B2
3735	A2
3736	B1
3741	A6
3742	B7
3743	F8
3744	F8
3745	F8
3746	E8
3748	C8
3749	C7
3751	E5
3752	F5
3753	F5
3754	E8
3755	E7
3756	D8
3757	D8
3758	D8
3759	D7
3760	A7
3761	E3
3762	E2
3763	A5
3764	A5
3765	B6
3766	B7
3767	A7
3768	E8
3769	E4
3770	F2
3771	F2
3772	F3
3773	E3
3774	E3
3775	F2
3776	F2
3777	F2
3778	E1
3779	D3
3780	D2
3781	D2
3782	C2
3784	D1
3785	C2
3786	F4
3787	C3
3788	C3
3789	F3
4790	C2
4794	C6
5701	D2
5702	C2
5703	F1
6770	E2
6771	E2
6772	D1
6773	D1
6774	D3
6775	C3
6776	F3
6777	E2
6778	E4
6782	C7
6785	A7
6786	B7
7710	A3
7720	A5
7730	D6
7740	A8
7780	F4
7781	F3
7782	E1
7783	E2
7784	D2
7785	C3
7786	C2
7787	C8
7791	F5
7792	D8
9791	A8
9792	B8
9793	A6

SERVO CONTROL CIRCUIT

1703	B1
1706	E1
1760	B8
1770	B7
2621	D2
2622	D2
2623	D2
2624	E2
2625	E4
3601	B2
3602	C2
3603	B2
3604	C2
3605	B3
3606	C3
3607	C6
3608	D6
3609	C6
3610	D6
3611	C6
3612	D6
3613	B2
3614	B6
3616	A5
3618	A4
3620	A4
3622	A4
3623	A3
3624	B6
3625	B3
3626	B6
3628	A5
3630	A6
3672	B4
3674	A5
3676	B5
3678	B5
3679	B3
3680	B5
3685	C2
3686	E6
3687	D2
3688	A5
3689	E3
4781	A5
4784	A1
4785	D2
4795	E3
6611	A2
6612	B6
6614	B4
7610	D4
7612	A6
7613	A3
7614	A6
7616	A4
7618	B6
7619	B4
7620	B6
7622	B5
7623	C2
7624	D6


1
2
3
4
5
6
7
8
9
A
B
C
D
E
SERVO CONTROL CCTRY
9.3V
NORM SPEED
HIGH SPEED
+MOTOR
DECK AB
PHOTO_A
SOL_A
CR02_A
H
L
Gnd
mode_B
Vcc
sol_B
photo_B
CrO2_B
Rec_FWD
Rec_RVS
1770 *
* 1760
To/From DECK MECHANISM
SOL_A
PHOTO_A
CR02_A
#4784
M
P
7613 BC807-25
7612 BC807-25
7614 BC807-25
7616 BC857B
7618 BC847B
7619 BC847B
7620 BC847B
7622 BC847B
7623 BC847B
7624 BC847B
6611 1N4003
6612 1N4003
6614 1N4148
3618 10K
3616 10K
3620 4K7
3622 4K7
4781 680R
3688 470R
3628 100K
3630 470R
3623 100K
3625 1K
3674 4K7
3672 4K7
3624 100K
3626 1K
3613 27K
3679 47K
3678 47K
3676 47K
3680 47K
3614 27K
3601 2K2
3603 2K2
3605 2K2
3602 27K
3604 56K
3606 120K
3611 2K2
3609 2K2
3607 2K2
3612 56K
3610 120K
3608 27K
3685 100K
3686 100K
3687 100R
4785
2623 470p
2622 470p
2621 1n
2624 100n
2625 100n
+5
1703
Rec_RVS
CRA
TO 3756
TO 3754 3757
HS
CRB
TO 6778 7730
GND_M
GND_P
2A2
HS
CRA
CRB
7610 HEF4094BT
VSS
VDD
E0
Os'
Os
STR
D
CP
O3
O7
O5
O6
O4
O0
O1
O2
NS/HS
2A2
TO 3740 7740 3691
MOT
SOL_B
SOL_A
REC
REC
1A0
TO 3786 3749 3779 6774 7730
1A0
TO 3753 6782 7710
2A1
2A1 TO 7740
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
TO/FROM FRONT
To/From SHEET 2
** 4795
3689 4K7
E/M
(xx V)
5V
3139 118 51470 sh 130-1 dd wk01

** Items used for pcb testing only

	Version	3689	4795
1.	ND / DD / FR	-	-
2.	ND / DD / FF	-	use
3.	ND / SD	use	-

DC Voltages measured with Dubbing Fe to Fe

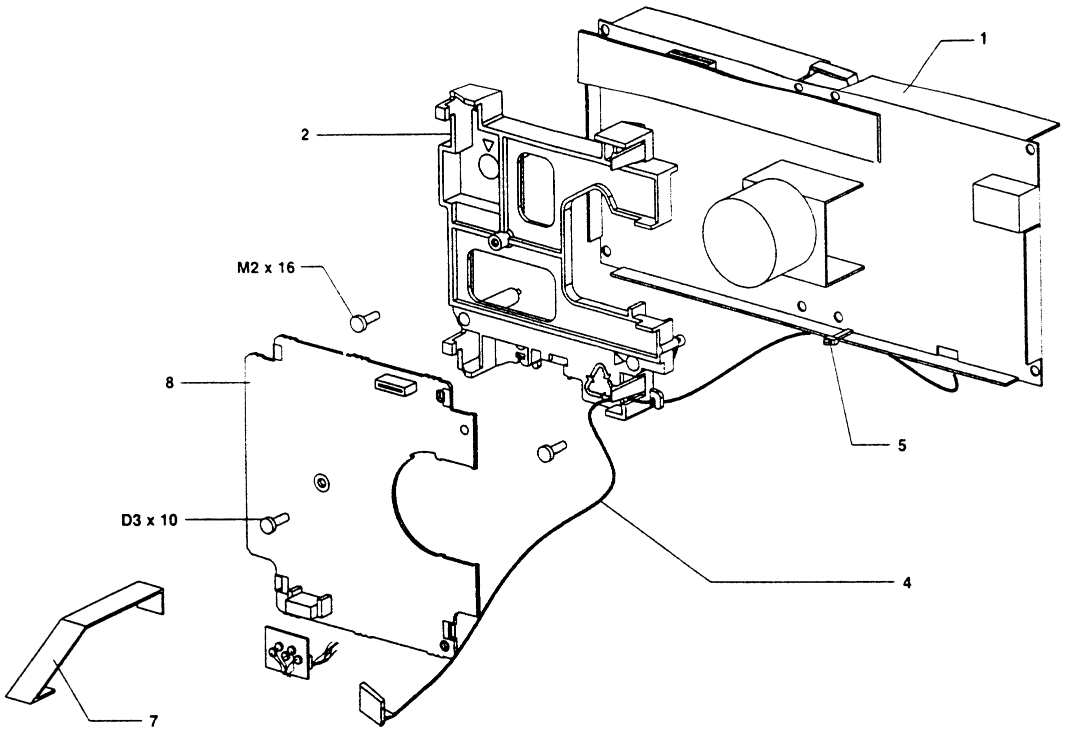
(xx V) Voltages during Solenoid On

5V Pulse to On Solenoid

*** See Variant Table for details**

# For Provision Only

L Not For Single Deck Variant


1
2
M2 x 16
8
5
D3 x 10
4
7

ETF6 TAPE MODULE EXPLODED VIEW

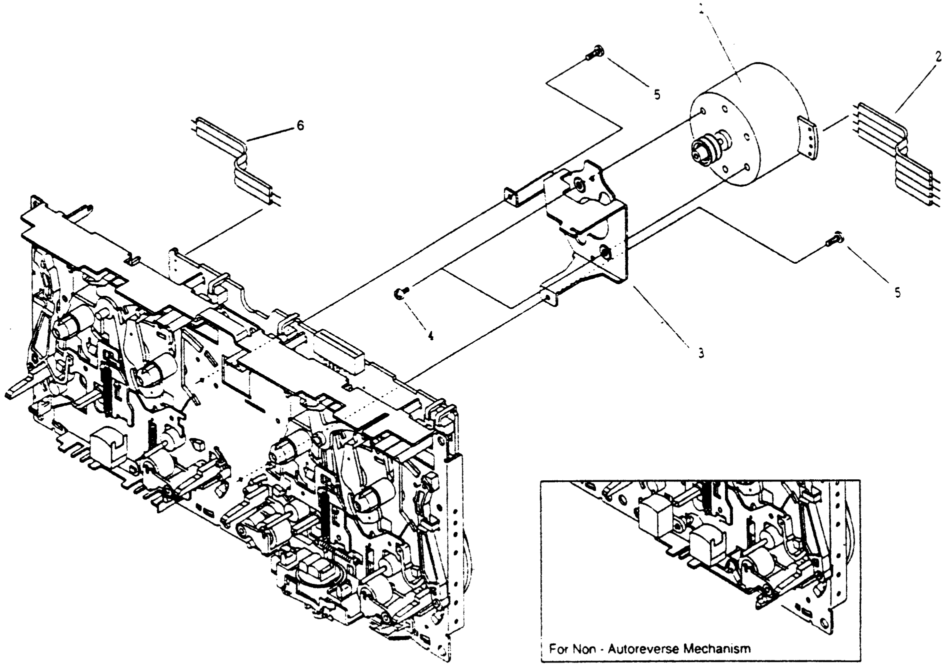
1	4822 691 10673	Autoreverse Mech. CWC44FR02
1	4822 691 10672	Non-Autoreverse Mech. CWC44FF01
7	4822 320 12245	Flex Cable 13 pin 7.5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

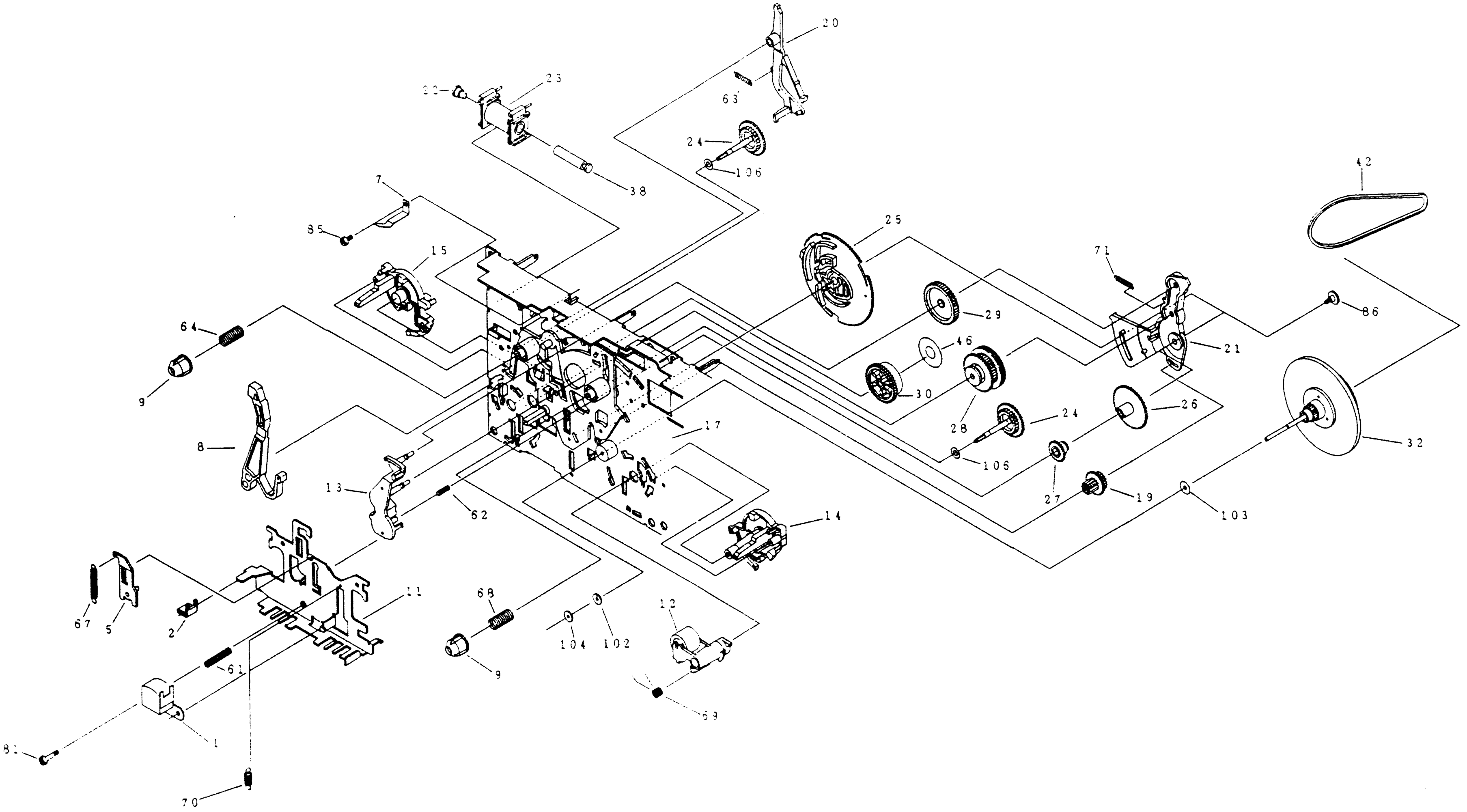
TAPE MECHANISM - MOTOR EXPLODED VIEW

1	4822 361 11055	Motor Assembly
4	-	Screw M2.6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.


2
5
6
5
4
3
For Non - Autoreverse Mechanism

TAPE MECHANISM A - PLAY


20
23
63
24
106
7
38
85
15
25
42
71
64
29
46
86
21
9
30
28
24
26
8
17
32
13
106
62
27
19
103
14
11
68
67
5
2
12
104
102
61
9
1
69
81
70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1	69	4822 492 11542	Spring
12	4822 402 10972	Pinch Arm Assembly Right	102	4822 532 12931	Washer
23	4822 157 11498	Coil Assembly	103	4822 532 12932	Washer
32	4822 528 11244	Flywheel Assembly RV	104	4822 532 12933	Washer
42	4822 358 10168	Belt AF			

Note: Only the parts mentioned in this list are normal service spare parts.

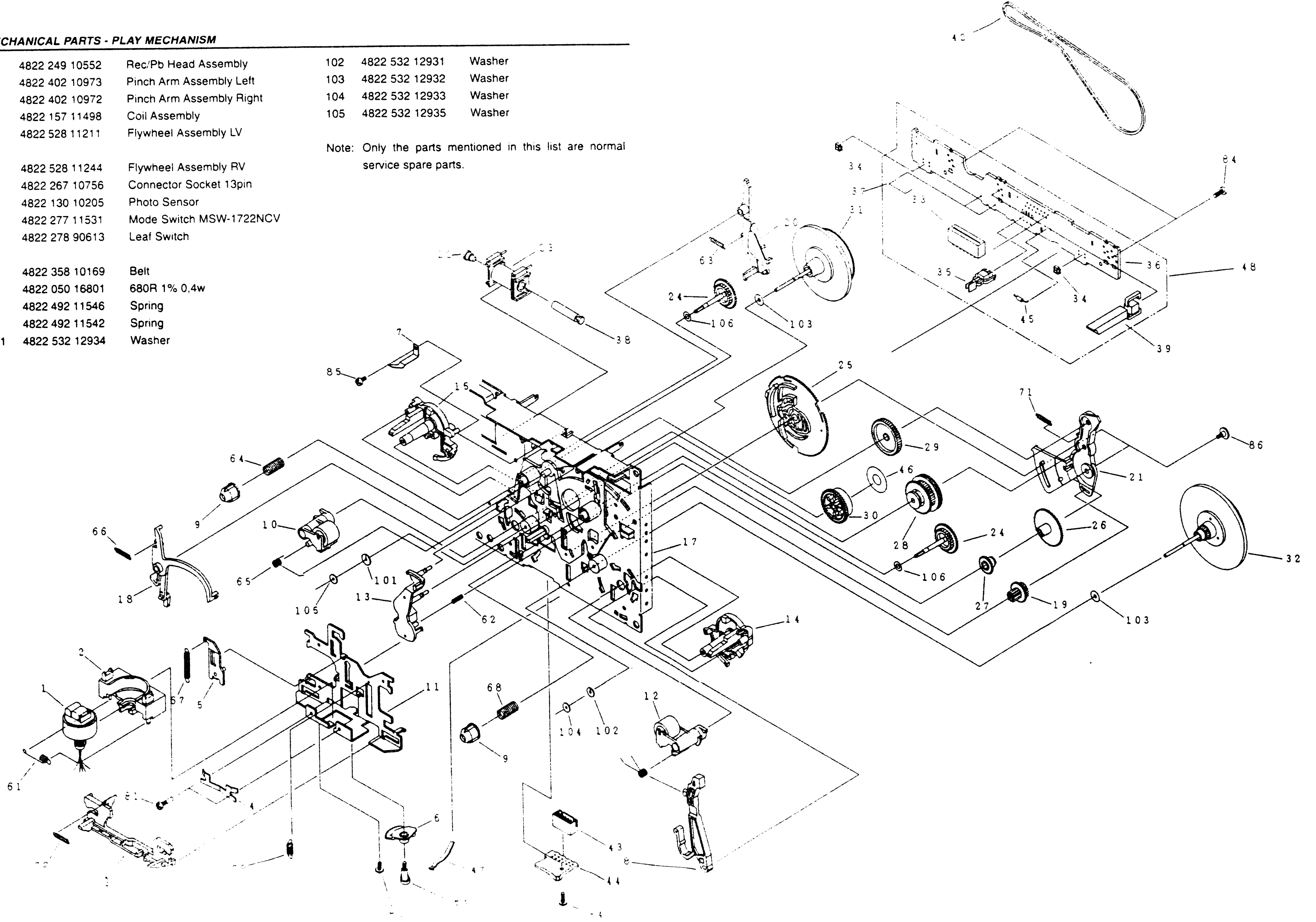
TAPE MECHANISM B - RECORD/PLAYBACK

(Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10552	Rec/Pb Head Assembly
10	4822 402 10973	Pinch Arm Assembly Left
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
31	4822 528 11211	Flywheel Assembly LV
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


42
84
34
32
33
31
30
36
48
35
34
45
39
63
24
106
103
23
38
7
85
15
25
71
86
29
46
21
64
9
30
28
24
26
32
66
10
17
106
27
19
103
18
65
101
105
13
62
14
2
1
67
5
11
68
12
104
102
9
61
81
4
6
43
8
44
47

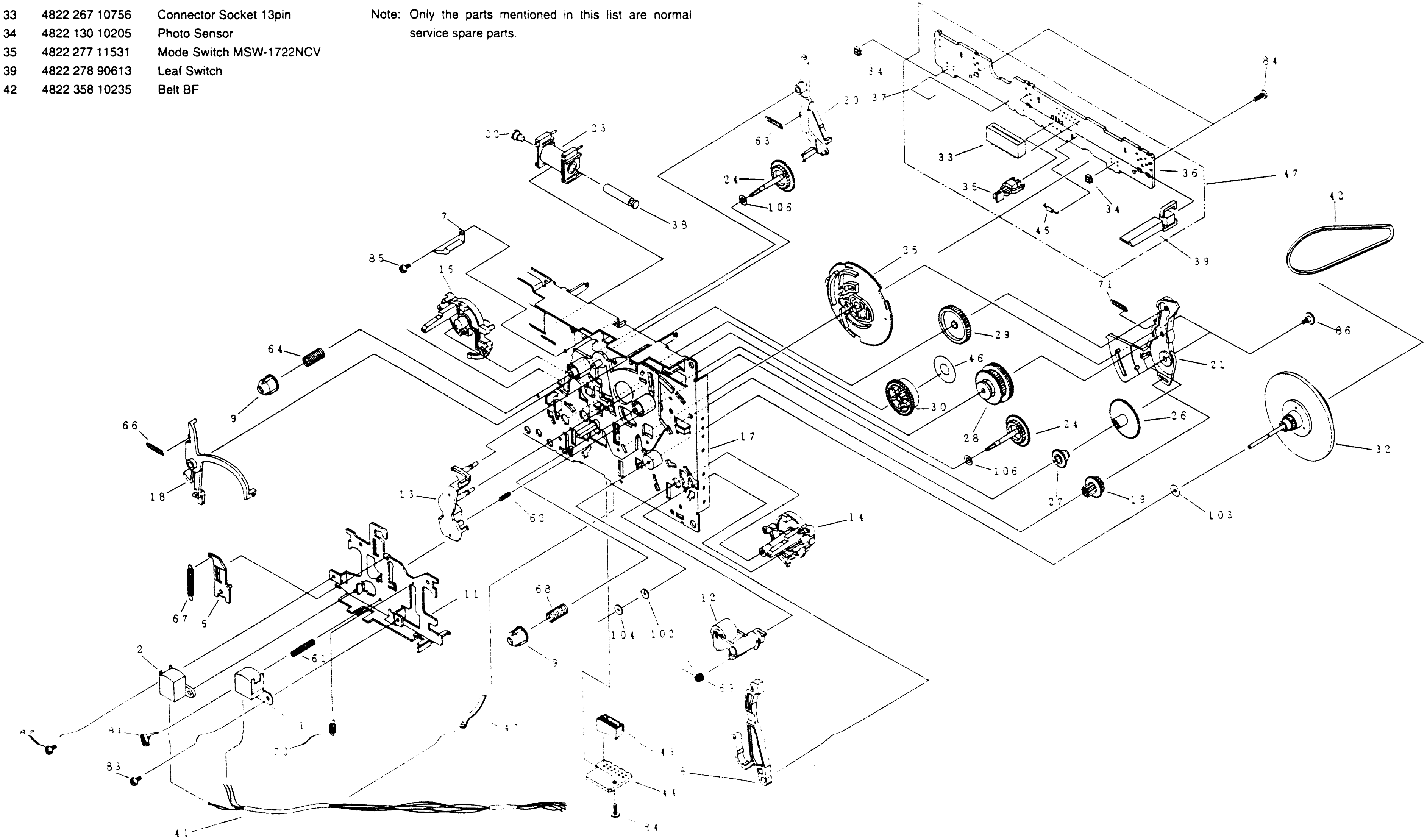
TAPE MECHANISM B - RECORD/PLAYBACK

(Non-Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	Rec/Pb Head Assembly	45	4822 050 16801	680R 1% 0,4w
2	4822 249 40303	Erase Head	69	4822 492 11542	Spring
12	4822 402 10972	Pinch Arm Assembly Right	102	4822 532 12931	Washer
23	4822 157 11498	Coil Assembly	103	4822 532 12932	Washer
32	4822 528 11244	Flywheel Assembly RV	104	4822 532 12933	Washer
33	4822 267 10756	Connector Socket 13pin			
34	4822 130 10205	Photo Sensor			
35	4822 277 11531	Mode Switch MSW-1722NCV			
39	4822 278 90613	Leaf Switch			
42	4822 358 10235	Belt BF			

Note: Only the parts mentioned in this list are normal service spare parts.


84
34
37
20
8
63
23
22
33
36
47
35
24
106
34
45
38
42
39
7
85
15
25
71
29
86
64
46
21
9
30
26
66
28
24
17
32
106
27
19
18
13
62
103
14
11
68
12
67
5
104
102
2
61
3
63
1
82
81
70
43
8
83
44
41
84

MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7P Vert.
1706	4822 267 10953	Flex Socket 7P Vert.
1770	4822 267 10738	Flex Socket 13P Vert.

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 13196	100nF 10% 25V
2625	4822 126 13196	100nF 10% 25V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	4822 122 33575	220pF 5% 50V
2706	4822 122 33575	220pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 40196	220µF 20% 16V
2716	4822 124 40196	220µF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 63V
2720	4822 126 12105	33nF 5% 63V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 34123	1nF 10% 50V
2728	5322 122 34123	1nF 10% 50V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13196	100nF 10% 25V
2737	4822 126 13196	100nF 10% 25V
2738	4822 126 13196	100nF 10% 25V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2744	4822 126 13196	100nF 10% 25V
2760	4822 126 13196	100nF 10% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40246	4,7µF 20% 63V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4.7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0.5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 117 10833	10k 1% 0,1W
3618	4822 117 10833	10k 1% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3703	4822 117 11503	220R 1% 0,1W
3704	4822 117 11503	220R 1% 0,1W
3705	4822 117 11503	220R 1% 0,1W
3706	4822 117 11503	220R 1% 0,1W
3707	4822 051 20101	100R 5% 0.1W
3708	4822 051 20101	100R 5% 0.1W

3709	4822 051 20688	6R8 5% 0,1W
3710	4822 051 20688	6R8 5% 0.1W
3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0.1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 1% 0,1W
3718	4822 117 11449	2k2 1% 0,1W
3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0.1W
3723	4822 117 11383	12k 1% 0,1W *Autoreverse*
3723	4822 051 20153	15k 5% 0,1W *Non-Autoreverse*
3724	4822 117 11383	12k 1% 0,1W *Autoreverse*
3724	4822 051 20153	15k 5% 0,1W *Non-Autoreverse*
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0.1W
3732	4822 117 11507	6k8 1% 0.1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20223	22k 5% 0,1W
3741	4822 117 11449	2k2 1% 0,1W
3742	4822 117 11449	2k2 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3743	4822 051 10102	1k 2% 0,25W *Non-Autoreverse*
3744	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3744	4822 051 10102	1k 2% 0,25W *Non-Autoreverse*
3745	4822 051 20332	3k3 5% 0,1W
3746	4822 051 20332	3k3 5% 0.1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0.1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 117 13579	220k 1% 0,1W
3757	4822 117 13579	220k 1% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0.1W
3761	4822 116 83864	10k 5% 0.5W
3762	4822 117 11454	820R 1% 0.1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0.1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11383	12k 1% 0,1W *Autoreverse*
3769	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20472	4k7 5% 0,1W *Autoreverse*
3772	4822 051 20562	5k6 5% 0,1W *Non-Autoreverse*
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 117 10833	10k 1% 0,1W *Autoreverse*
3774	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688	△ 6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

RESISTORS

4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4781	4822 051 20681	680R 5% 0,1W
4785	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805
4795	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Oscillator Coil 100kHz

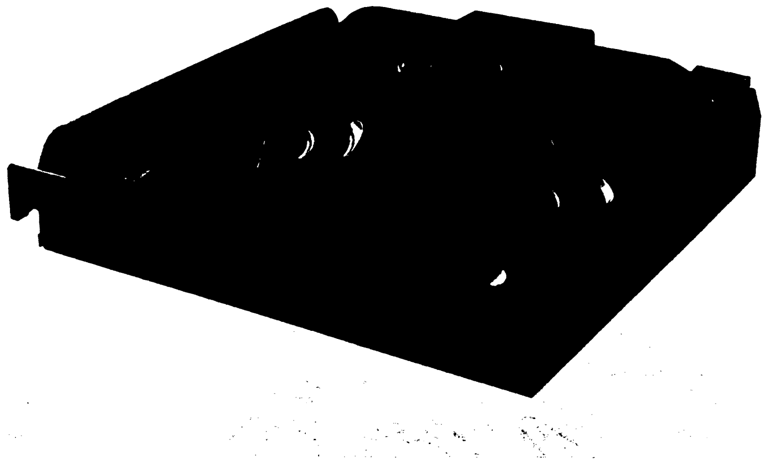
DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.



3CDC 99 Module
(3 Disc Carrousel Changer)

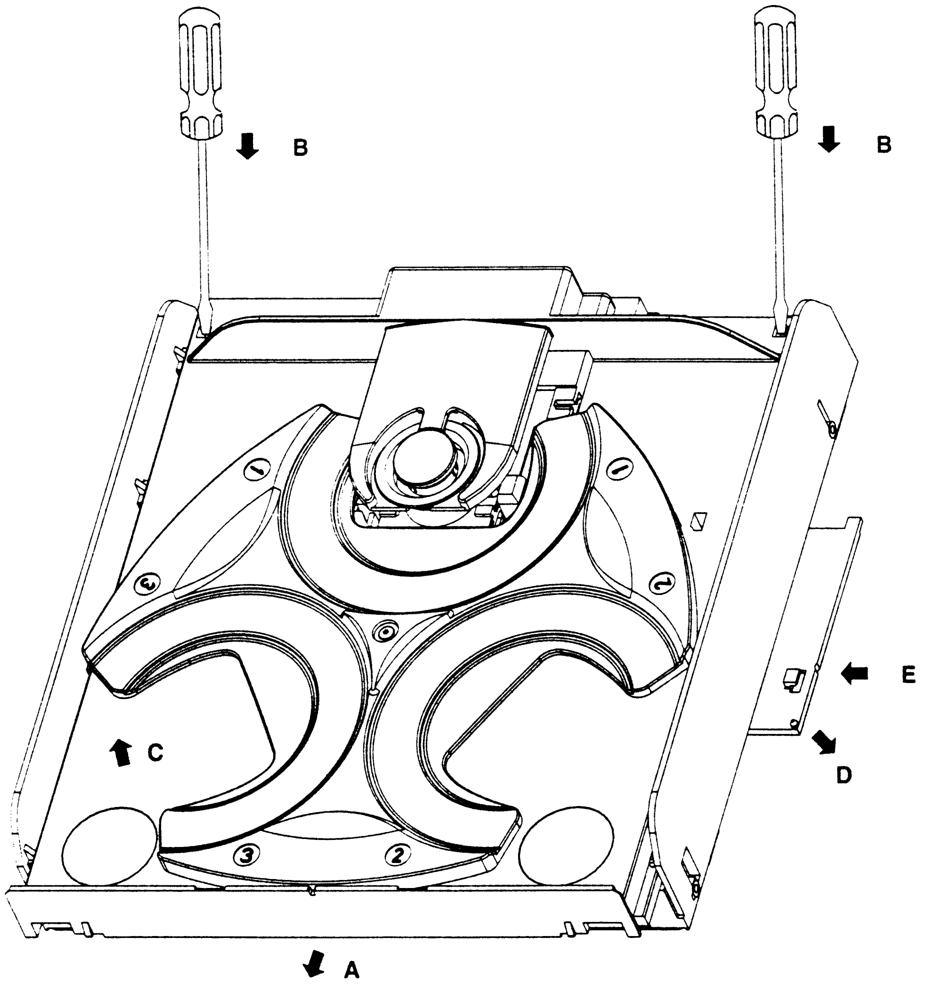
ReWritable CD

COMPACT disc DIGITAL AUDIO

TABLE OF CONTENTS

Demounting Hints 10-2
Servicing Hints 10-3
Lubrication Instructions 10-4
ESD Warnings 10-6
Blockdiagram 10-7
Wiring 10-8
Circuit Diagram part1 10-9
Component Layout 10-10
Circuit Diagram part2 10-11
Exploded View 10-12
Mechanical Partslist 10-13
Electrical Partslist 10-15

Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

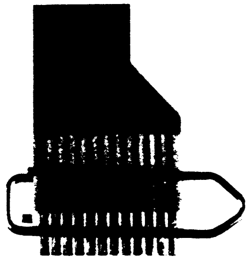
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

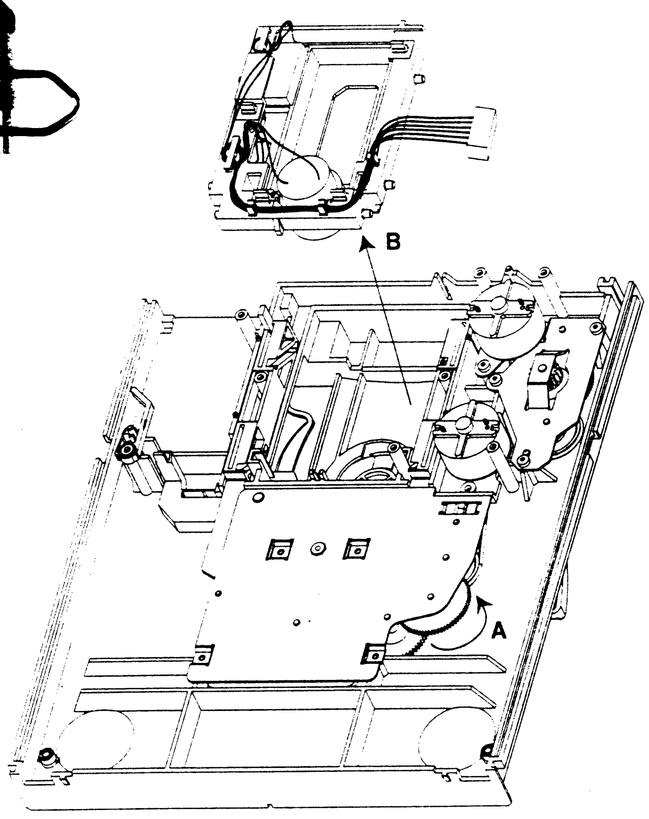
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount printed circuit board: remove 5 screws.
2. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
3. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below A .
5. Demount CD drive support (pos 95) B .
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

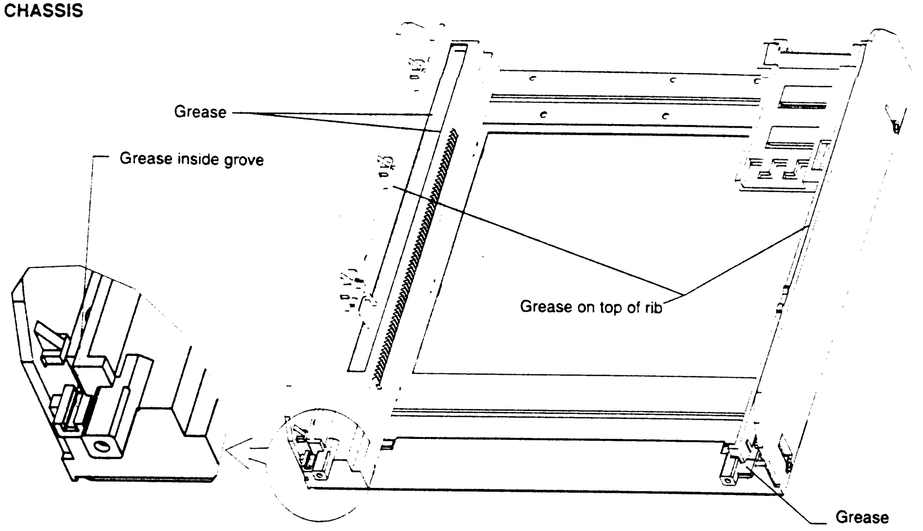


Mounting of Carrousel

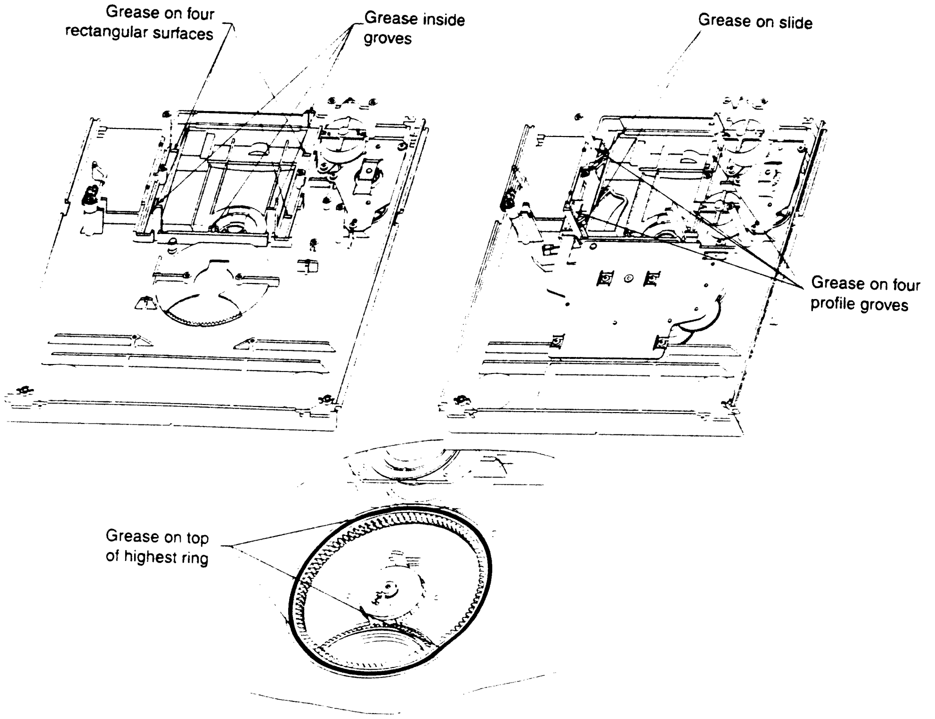
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn't matter.

Lubrication Instructions

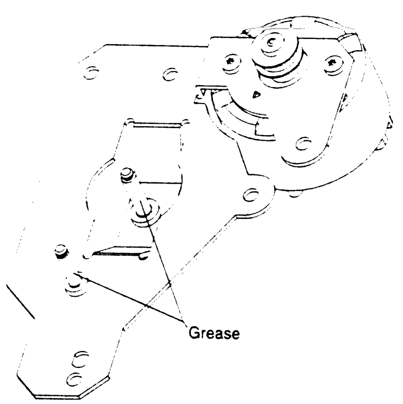
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

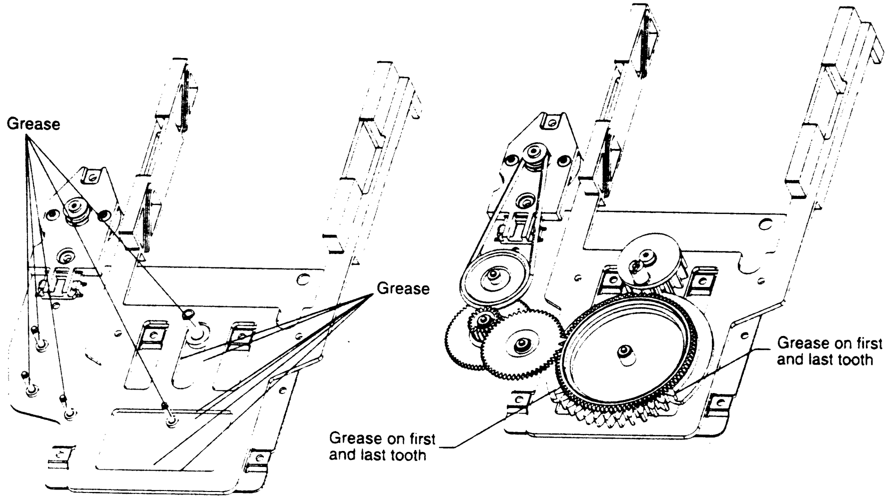
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
- *SWITCH OFF POWER SUPPLY*
- *ESD PROTECTION*

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:
1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

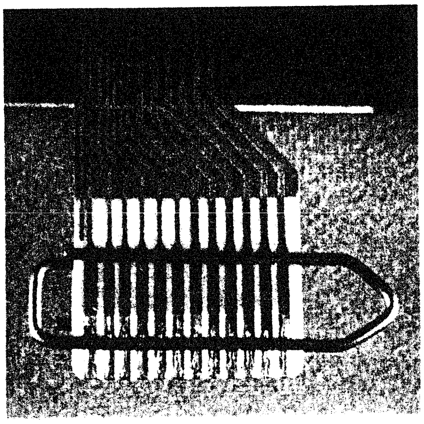


fig.1

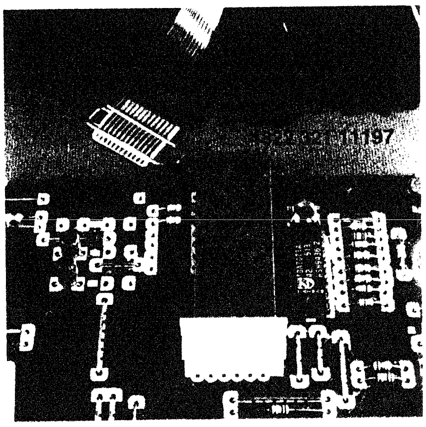


fig.2

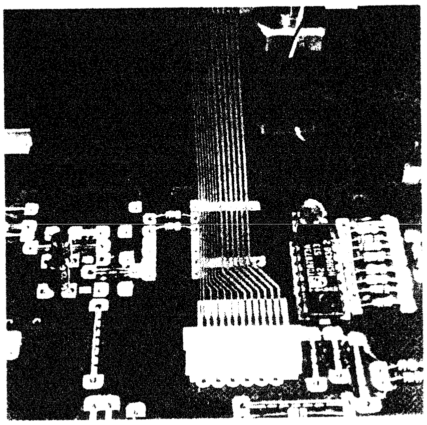
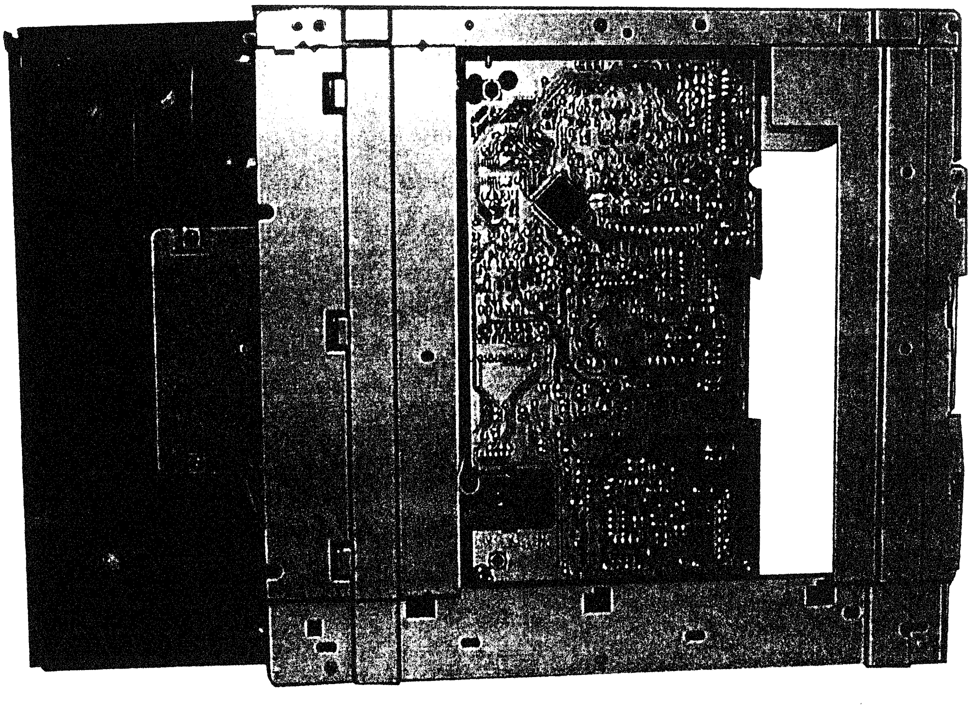
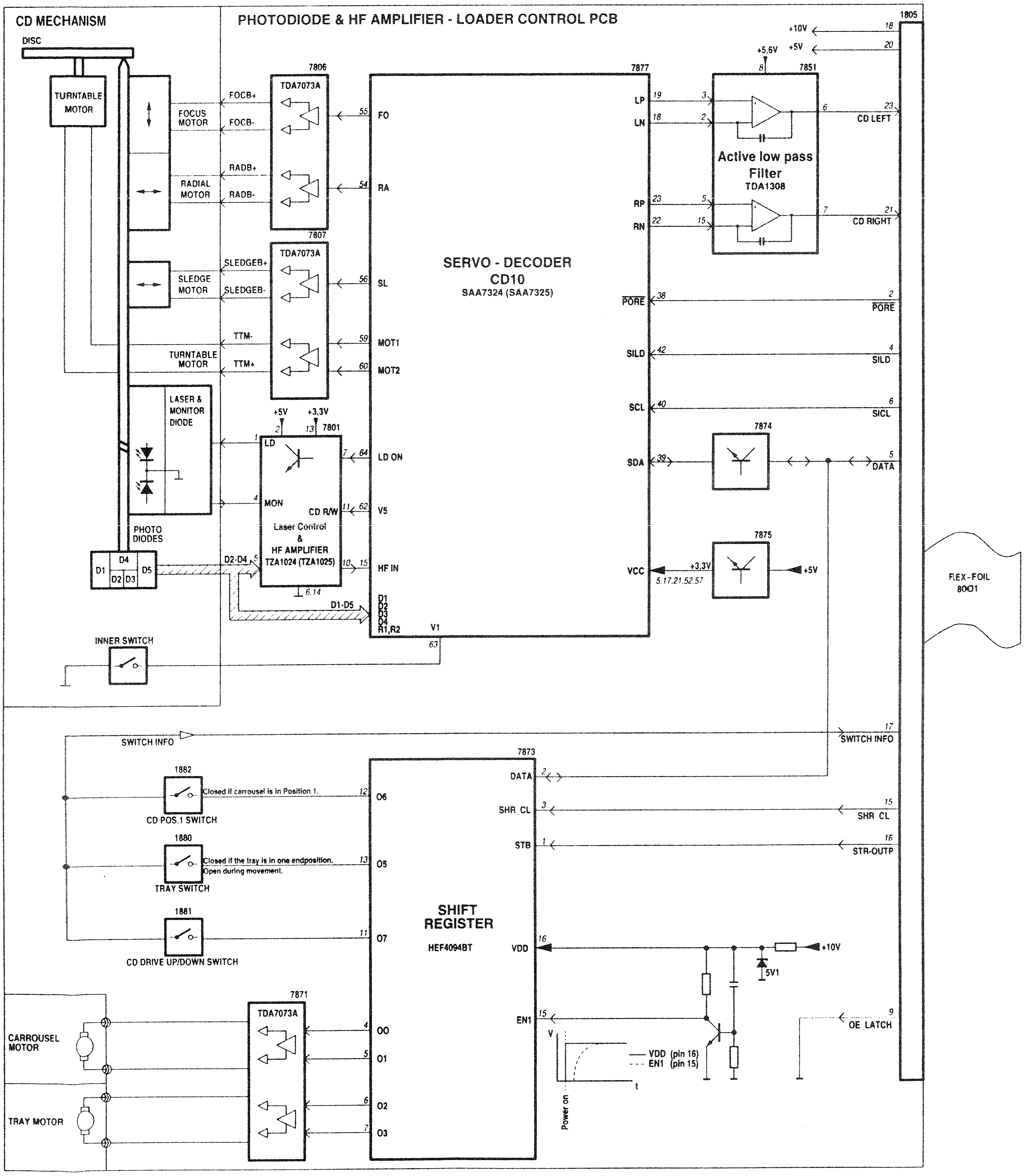


fig.3

Service Position

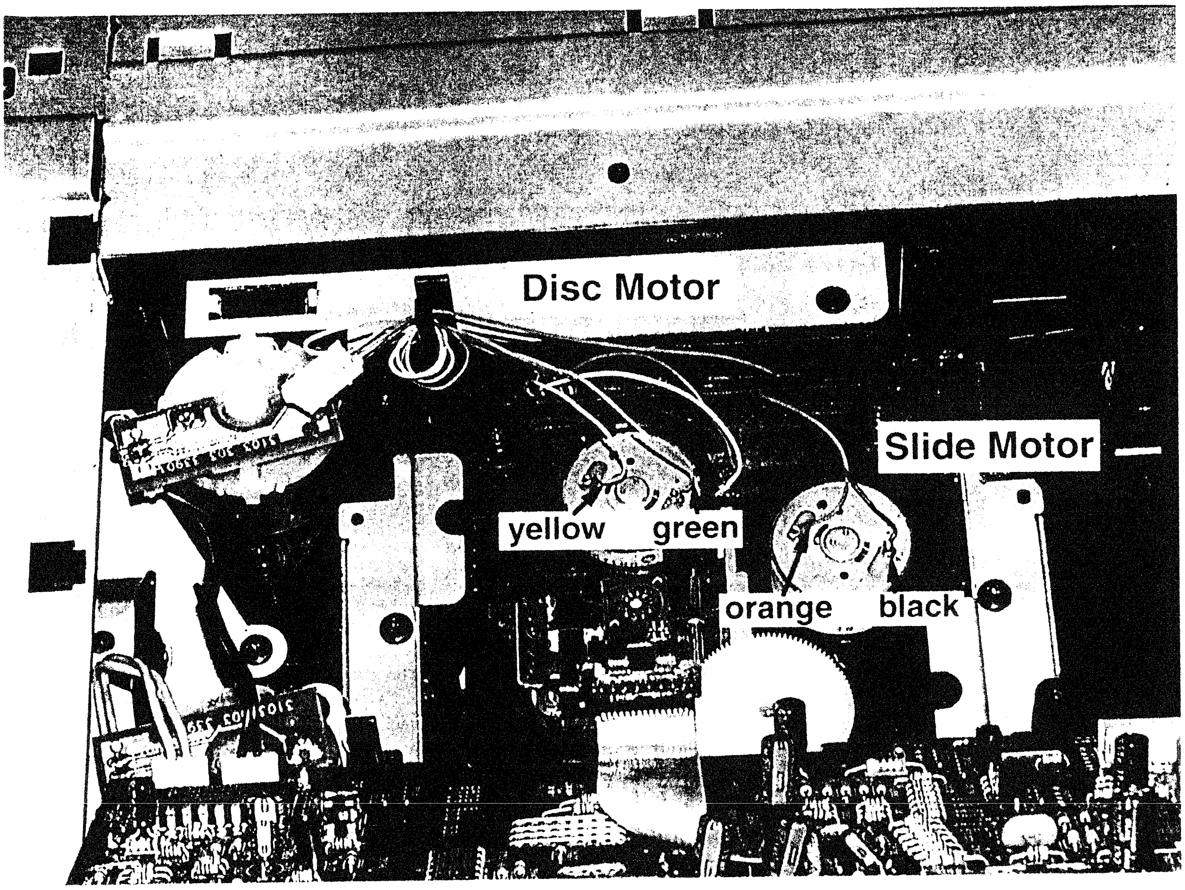


Blockdiagram

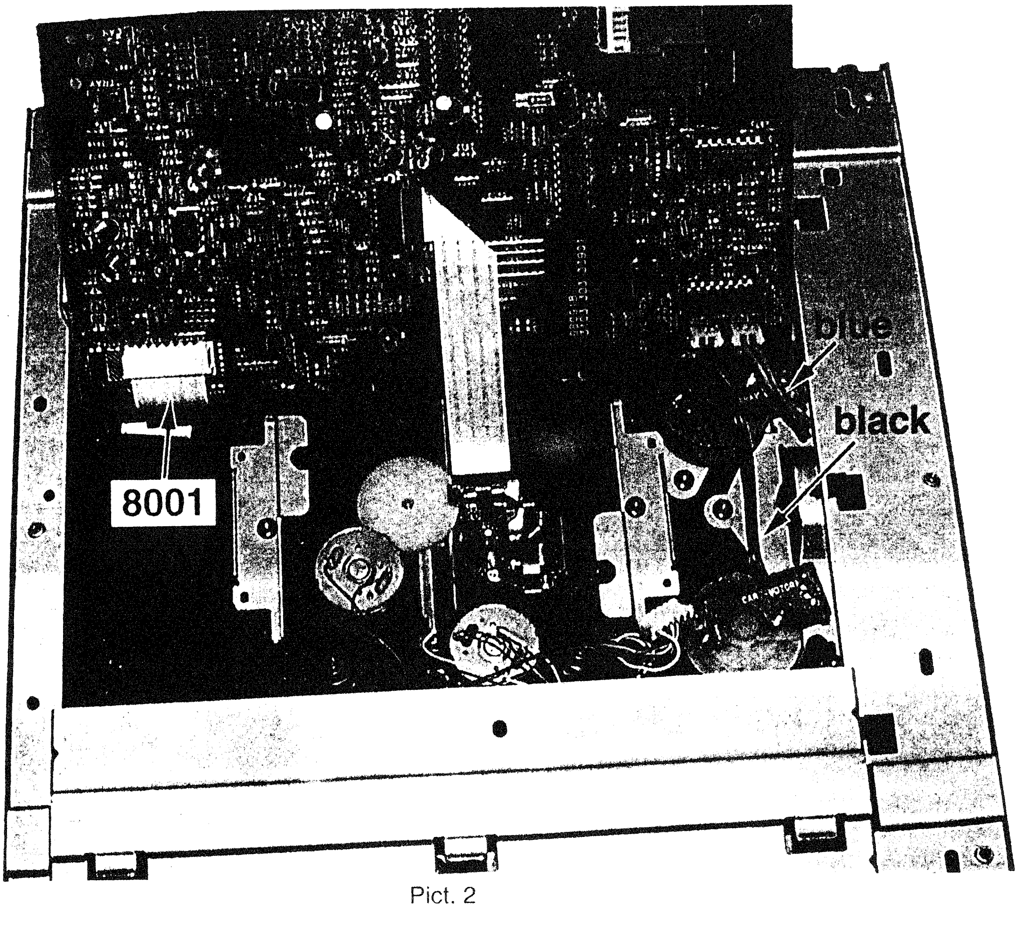

CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER & MONITOR DIODE
PHOTO DIODES
D1 D2 D3 D4 D5
INNER SWITCH
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
FOCB+
FOCB-
RADB+
RADB-
SLEDGEB+
SLEDGEB-
TTM-
TTM+
7806
TDA7073A
7807
TDA7073A
55
54
56
59
60
+5V
+3,3V
2
13
7801
LD
MON
CD R/W
Laser Control & HF AMPLIFIER
TZA1024 (TZA1025)
1
4
7
64
11
62
10
15
D2-D4
5
6.14
D1-D5
7877
SERVO - DECODER
CD10
SAA7324 (SAA7325)
FO
RA
SL
MOT1
MOT2
LD ON
V5
HF IN
D1 D2 D3 D4 R1,R2
V1
63
LP
LN
RP
RN
PORE
SILD
SCL
SDA
VCC
19
18
23
22
38
42
40
39
+3,3V
5.17.21.52.57
7851
+5,6V
+5V
+10V
8
3
2
5
15
6
7
Active low pass Filter
TDA1308
7874
7875
+5V
1805
18
20
23
CD LEFT
21
CD RIGHT
2
PORE
4
SILD
6
SICL
5
DATA
FLEX-FOIL
8001
SWITCH INFO
17
SWITCH INFO
1882
Closed if carrousel is in Position 1.
CD POS.1 SWITCH
1880
Closed if the tray is in one endposition.
Open during movement.
TRAY SWITCH
1881
CD DRIVE UP/DOWN SWITCH
12
13
11
7873
SHIFT REGISTER
HEF4094BT
DATA
SHR_CL
STB
VDD
EN1
O6
O5
O7
O0
O1
O2
O3
2
3
1
16
15
15
SHR_CL
16
STR-OUTP
+10V
5V1
9
OE_LATCH
V
t
Power on
VDD (pin 16)
EN1 (pin 15)
7871
TDA7073A
4
5
6
7
CARROUSEL MOTOR
TRAY MOTOR

Blockdiagram 3CDC90 19981202

Wiring of CD Drive

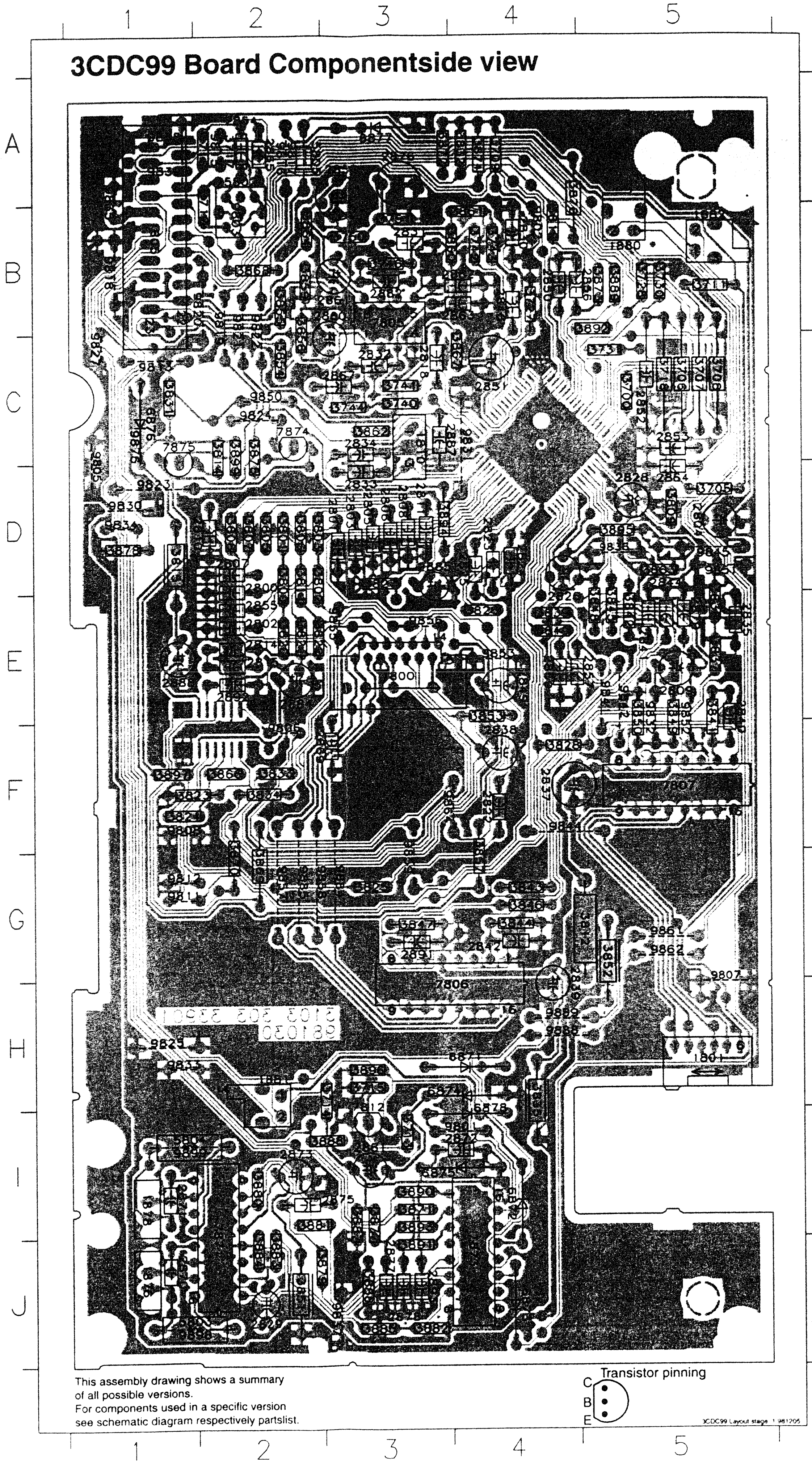

Disc Motor
Slide Motor
yellow
green
orange
black

Pict. 1


blue
black
8001

Pict. 2

3CDC99 Board Componentside view

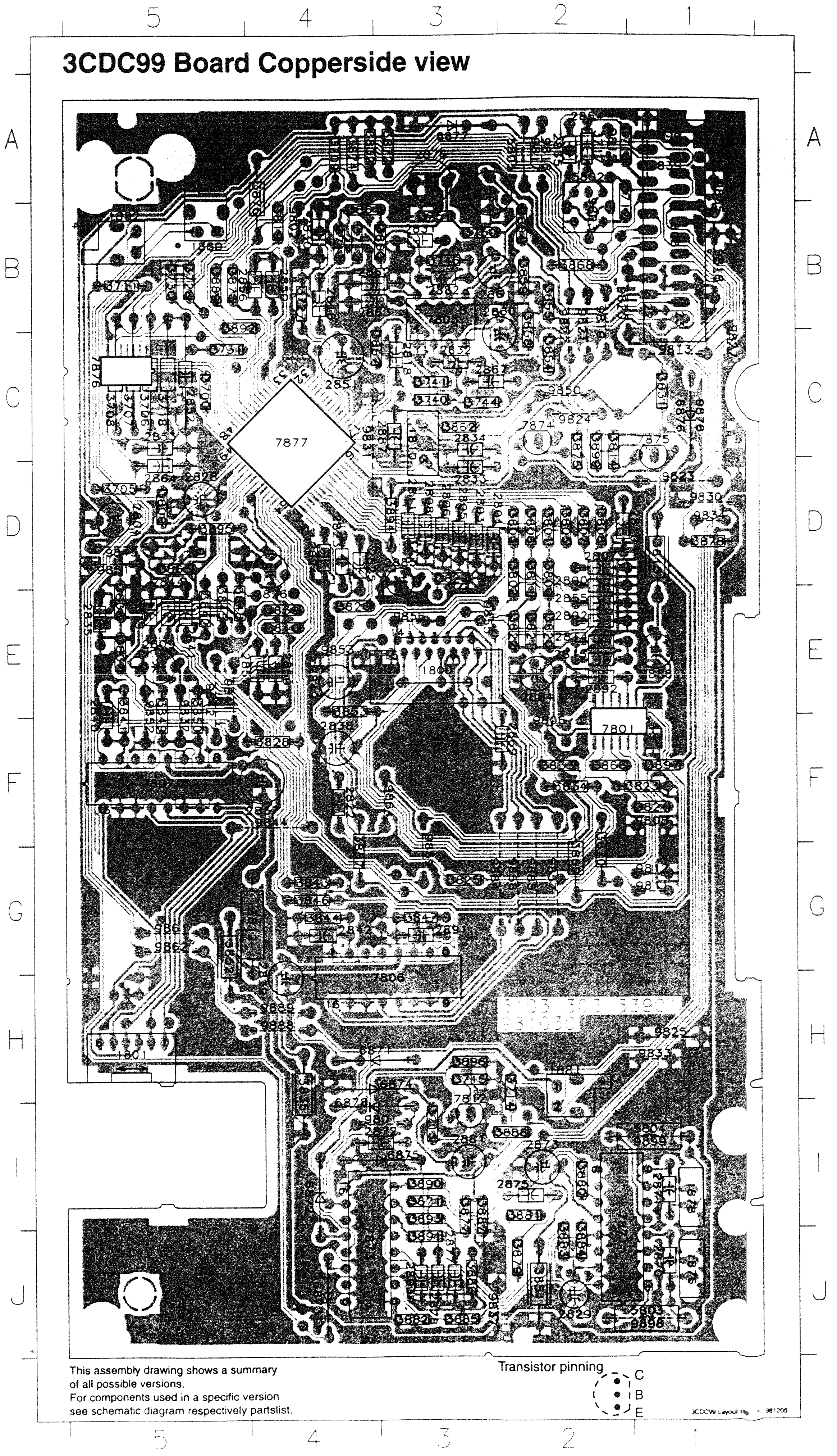


This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

Mapping

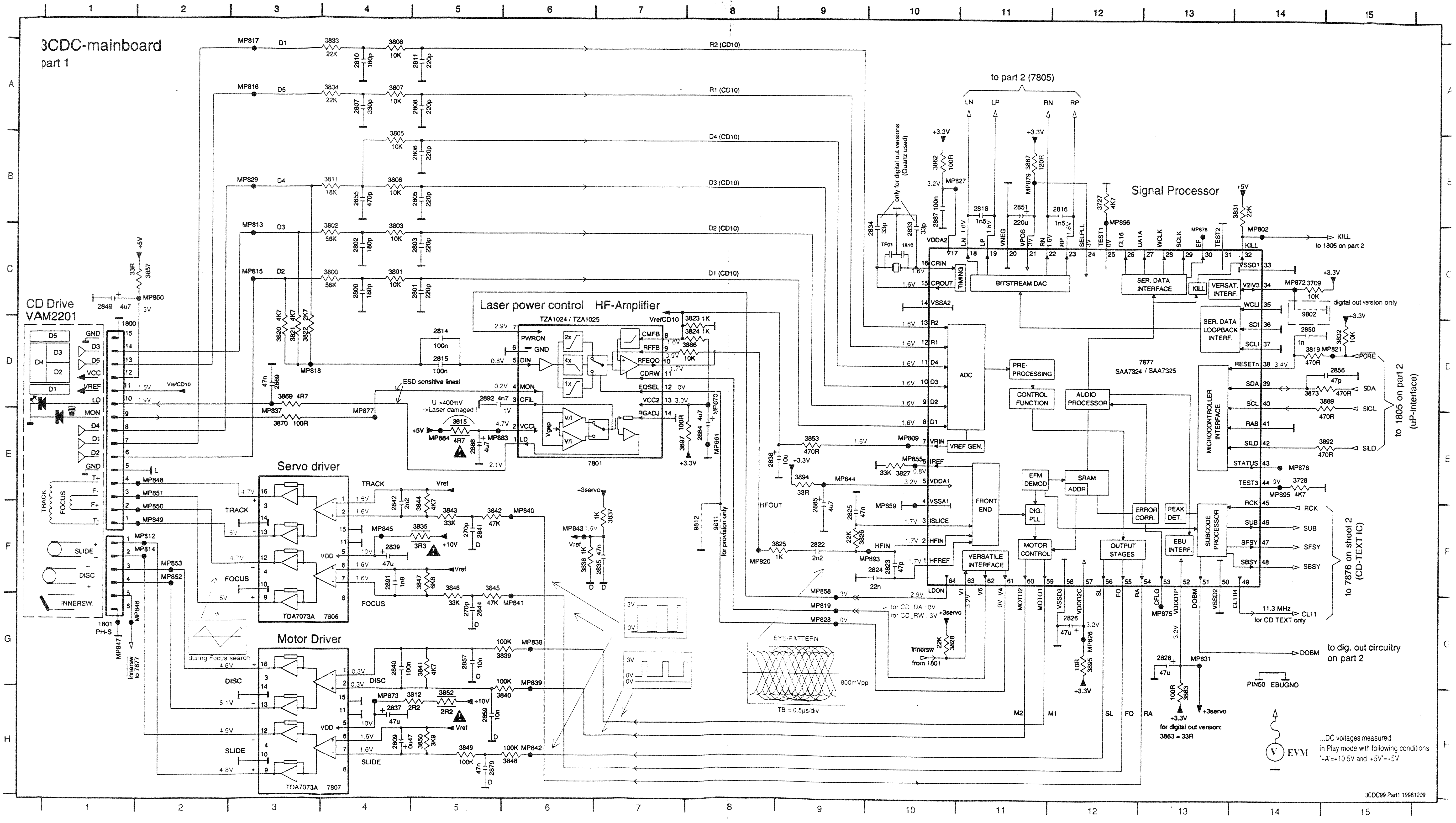
1800	E3
1801	H5
1805	B1
1810	C3
1876	J1
1878	I1
1880	B5
1881	H2
1882	B5
2800	D2
2801	D3
2802	E2
2803	D3
2804	D5
2805	D3
2806	D3
2807	D2
2808	D3
2809	E5
2810	D2
2811	D3
2814	E2
2815	E2
2816	B4
2818	C3
2822	F4
2823	D4
2824	D4
2825	D4
2826	E4
2828	D5
2829	J2
2830	B4
2831	B3
2832	C3
2833	D3
2834	C3
2835	E5
2837	F4
2838	F4
2839	H4
2840	E5
2841	E5
2842	G4
2844	D5
2849	E4
2850	B4
2851	C4
2852	C5
2853	C5
2854	A2
2855	E2
2856	B5
2857	E5
2858	A3
2859	E4
2860	B3
2861	B3
2862	B4
2863	B4
2864	D5
2865	A2
2867	C3
2869	F2
2870	J1
2871	I1
2872	I4
2873	I2
2875	I3
2876	A3
2877	J3
2878	J3
2879	E5
2881	I3
2882	B3
2884	E2
2885	D3
2887	C4
2888	E1
2891	G3
2892	E2
2893	J3
3700	C5
3705	D5
3706	C5
3707	C5
3708	C5
3709	A4
3711	B5
3712	B2
3713	I3
3714	H3
3715	H3
3716	A2
3717	A2
3718	C5
3727	B4
3728	B5
3730	B5
3731	C5
3740	C3
3741	C3
3742	B4
3743	B4
3744	C3
3746	B3
3750	B3
3751	B3
3800	D2
3801	D2
3802	D2
3803	D2
3805	D2
3806	D2
3807	D2
3808	D2
3809	D5
3811	D2
3812	G5
3814	C2
3815	D1
3819	B4
3820	E2
3821	E2
3822	E2
3823	F1
3824	F1
3825	G3
3826	E4
3827	D3
3828	F4
3831	C1
3832	A4
3833	F2
3834	F2
3835	H4
3837	E5
3838	E5
3839	E4
3840	E4
3841	E5
3842	E5
3843	G4
3844	G4
3845	E5
3846	G4
3847	G3
3848	E5
3849	E5
3850	E5
3851	J2
3852	G5
3853	E4
3854	C2
3855	B2
3857	G4
3858	C2
3859	B2
3860	B4
3861	B4
3862	C3
3863	D5
3864	B2
3866	F2
3867	C4
3868	B2
3869	G2
3870	G2
3871	I3
3872	A3
3873	B5
3874	A4
3875	C2
3876	A4
3877	I3
3878	D1
3879	J2
3880	I2
3881	I2
3882	J3
3883	J2
3884	J2
3885	J3
3886	J3
3887	I3
3888	I3
3889	B5
3890	I3
3891	J3
3892	B5
3893	I3
3894	D3
3895	D5
3896	H3
3897	F1
3899	C2
5802	A2
5803	J1
5804	I1
5805	A2
6871	H4
6872	I4
6873	J4
6874	H3
6875	I3
6876	C1
6877	A3
6878	H4
7801	F1
7805	B3
7806	H3
7807	F5
7812	H3
7871	J2
7873	J4
7874	C2
7875	C1
7876	C5
7877	C4
9801	I4
9802	B4
9803	B2
9805	D1
9806	F2
9807	G5
9808	F1
9811	G1
9812	G1
9813	C1
9815	A2
9816	A2
9817	A2
9818	B1
9819	B2
9820	B2
9821	B2
9822	B2
9823	D1
9824	C2
9825	H1
9827	C1
9830	D1
9831	C4
9832	E5
9833	H1
9834	D1
9835	A1
9836	D5
9837	J3
9838	A1
9839	A1
9841	E5
9842	E5
9844	F4
9845	D5
9850	C2
9851	D5
9852	E5
9853	E4
9855	E3
9856	E3
9857	G2
9858	G2
9859	G3
9861	G5
9862	G5
9864	F3
9876	C1
9884	G3
9885	G2
9888	H4
9889	H4
9898	J1
9899	I1

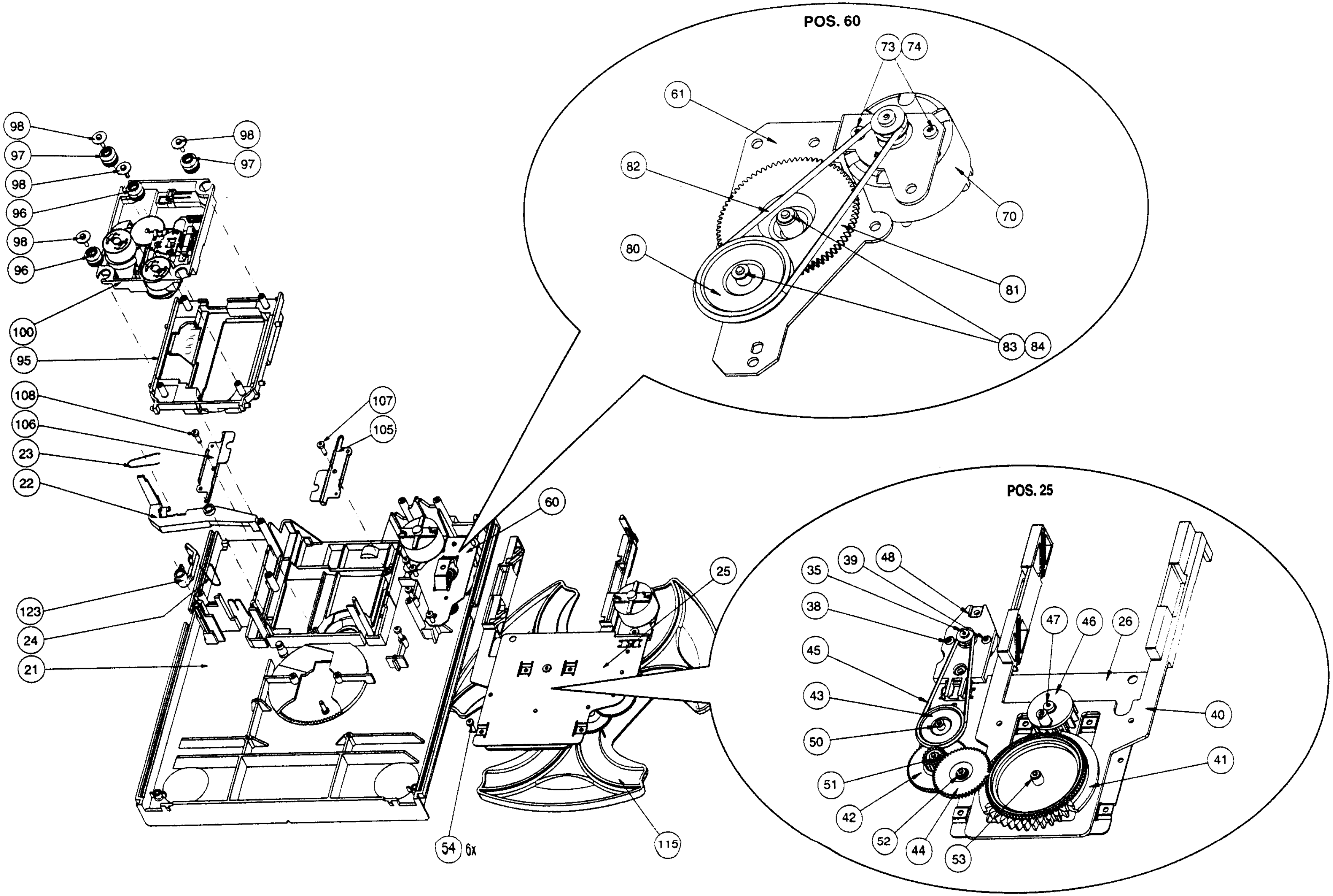
3CDC99 Board Copperside view



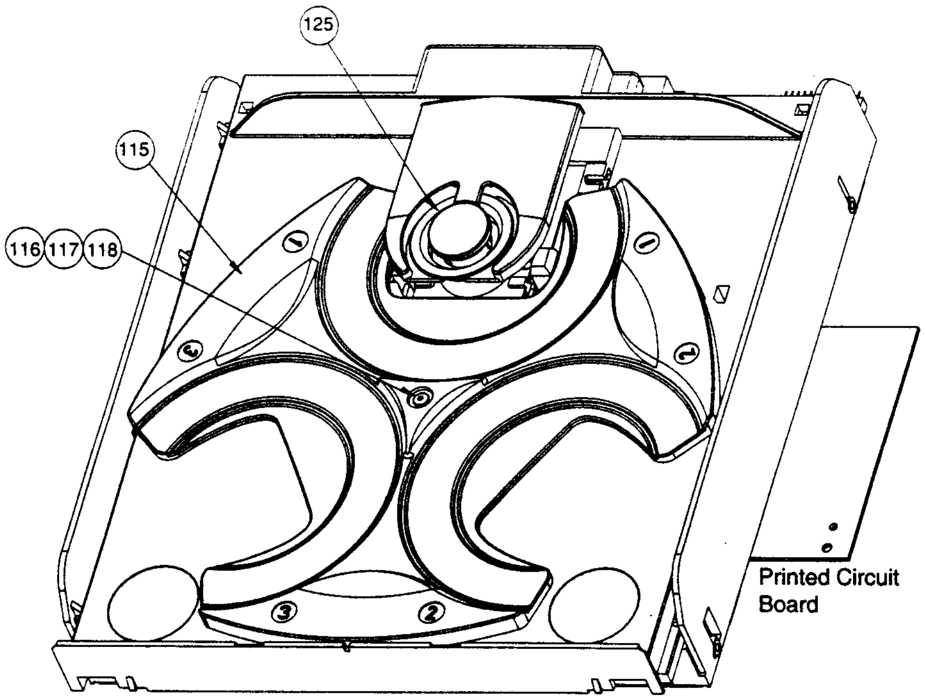
This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

1800	D2
1801	G1
1810	C10
2800	C4
2801	C5
2802	C4
2803	C5
2805	B5
2806	B5
2807	A4
2808	A5
2809	H4
2810	A4
2811	A5
2814	D5
2815	D5
2816	B12
2818	B11
2822	F9
2823	F10
2824	F10
2825	F9
2826	G12
2828	G13
2833	C10
2834	C10
2835	F7
2837	H4
2838	E8
2839	F4
2840	G4
2841	F5
2842	F4
2844	G5
2849	C1
2850	D14
2851	B11
2855	B4
2856	D15
2857	G5
2859	H5
2869	D3
2879	H5
2880	D8
2884	E8
2885	F9
2887	B10
2888	E5
2891	F4
2892	D5
3709	C14
3727	B12
3728	E14
3800	C4
3801	C4
3802	C4
3803	C4
3805	B4
3806	B4
3807	A4
3808	A4
3811	B4
3812	H5
3815	E5
3819	D14
3820	D3
3821	D3
3822	D3
3823	D8
3824	D8
3825	F9
3826	F9
3827	E10
3828	G10
3831	B14
3832	D15
3833	A4
3834	A4
3835	F5
3837	F7
3838	F6
3839	G6
3840	H6
3841	G5
3842	F5
3843	F5
3844	F5
3845	F5
3846	F5
3847	F5
3848	H6
3849	H5
3850	H5
3852	H5
3853	E9
3857	C2
3862	B10
3863	H13
3866	D8
3867	B11
3869	D3
3870	E3
3873	D14
3889	D15
3892	E15
3894	E9
3895	G12
3897	E7
7801	E7
7806	G4
7807	H4
7877	D12
9802	C14
9811	F8
9812	F8


3CDC-mainboard
part 1
CD Drive
VAM2201
Laser power control
HF-Amplifier
TZA1024 / TZA1025
7801
Servo driver
TDA7073A
7806
Motor Driver
TDA7073A
7807
Signal Processor
7877
SAA7324 / SAA7325
to part 2 (7805)
LN
LP
RN
RP
BITSTREAM DAC
ADC
PRE-PROCESSING
CONTROL FUNCTION
AUDIO PROCESSOR
FRONT END
EFM DEMOD
SRAM
ADDR
DIG. PLL
MOTOR CONTROL
VERSATILE INTERFACE
OUTPUT STAGES
ERROR CORR.
PEAK DET.
EBU INTERF.
SUBCODE PROCESSOR
MICROCONTROLLER INTERFACE
SER. DATA LOOPBACK INTERF.
SER. DATA INTERFACE
VERSAT. INTERF.
KILL
TIMING
VREF GEN.
to 1805 on part 2
to 1805 on part 2 (uP-interface)
to 7876 on sheet 2 (CD-TEXT IC)
to dig. out circuitry on part 2
11.3 MHz
for CD TEXT only
digital out version only
only for digital out versions (Quartz used)
for digital out version:
3863 = 33R
for provision only
ESD sensitive lines!
U >400mV ->Laser damaged !
EYE-PATTERN
800mVpp
TB = 0.5µs/div
during Focus search
TRACK
FOCUS
DISC
SLIDE
INNERSW.
Innersw to 7877
PIN50 EBUGND
EVM
..DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V
3CDC99 Part1 19981209


POS. 60
54 6x
POS. 25

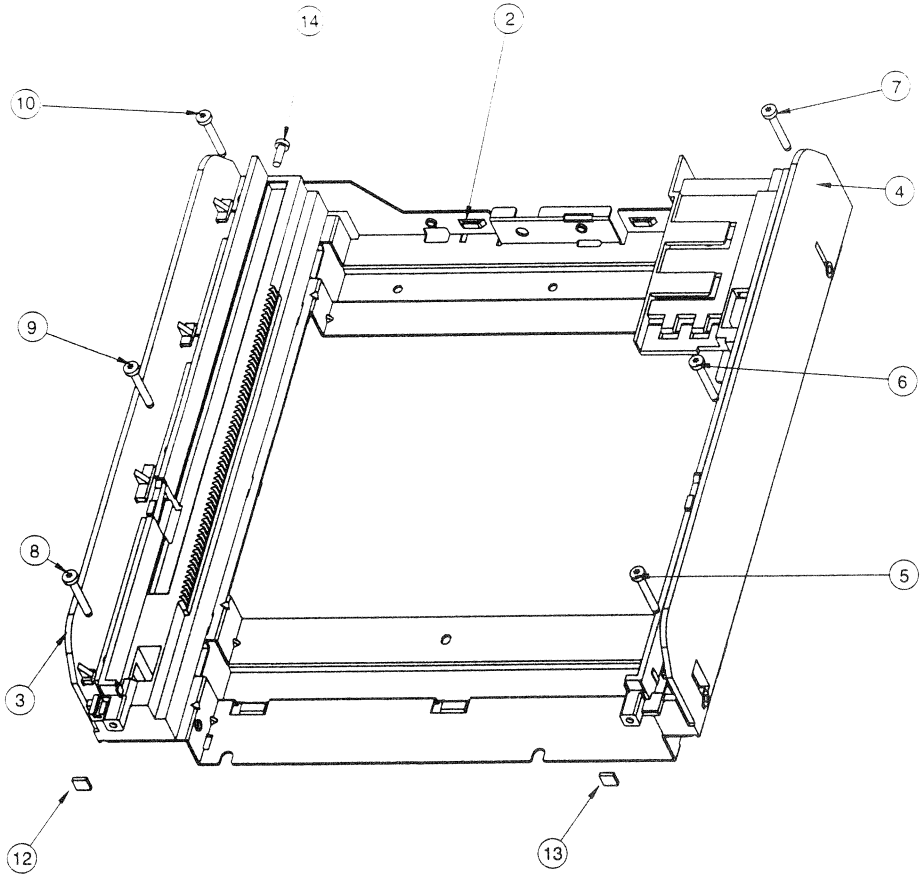
CS 53 195



MECHANICAL PARTSLIST 3CDC-99 MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)	43	4822 528 10937	PULLEY
3	4822 463 11008	GUIDE LEFT	44	4822 522 10493	IDLER WHEEL
4	4822 463 11009	GUIDE RIGHT	45	4822 358 10115	BELT
21	4822 441 11615	DRAWER	46	4822 466 10735	ECCENTRIC GEAR WHEEL
22	[illegible]	BRACKET TUMBLER	50	4822 532 12364	WASHER
38	4822 502 12548	SCREW M2.6X3.5	51	4822 532 12364	WASHER
39	4822 502 12548	SCREW M2.6X3.5	52	4822 532 12364	WASHER
40	4822 463 11011	SLIDE	53	4822 532 12364	WASHER
41	4822 522 10509	CONTROL DISC	35	4822 361 10753	CARROUSEL MOTOR
42	4822 522 10492	GEAR WHEEL	70	4822 361 10753	CARROUSEL MOTOR

continued on next page



MECHANICAL PARTSLIST 3CDC-99 MODULE

73	4822 502 12548	SCREW M2.6X3.5
74	4822 502 12548	SCREW M2.6X3.5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10895	SUPPORT
96	4822 529 10431	SUSPENSION
97	4822 529 10431	SUSPENSION
100	4822 691 10772	CD DRIVE VAM2201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
123	4822 402 11237	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP

ELECTRICAL PARTSLIST 3CDC-99 MODULE

MISCELLANEOUS

1800	4822 265 10925	FLEX FOIL CONNECTOR 15PIN
1805	4822 265 11533	FLEX FOIL CONNECTOR 23PIN
1805	4822 267 51322	FLEX FOIL CONNECTOR 15 PIN
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 124 40246	4.7μF	20%	63V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12787	330pF	10%	50V
2808	4822 122 10466	220pF	10%	50V
2809	5322 124 41948	0,47μF	20%	50V
2810	4822 126 10053	180pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2814	4822 126 12785	47nF	20%	50V
2815	4822 126 12882	100nF	20%	50V
2816	4822 126 12878	1,5nF	10%	16V
2818	4822 126 12878	1,5nF	10%	16V
2822	4822 126 12339	2.2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12785	47nF	20%	50V
2826	4822 124 80231	47μF	20%	16V
2828	4822 124 40433	47μF	20%	25V
2829	4822 124 21732	10μF	20%	25V
2830	4822 126 12785	47nF	20%	50V
2831	4822 122 33195	100pF	10%	50V
2832	4822 122 33195	100pF	10%	50V
2833	4822 122 33069	33pF	5%	50V
2834	4822 122 33069	33pF	5%	50V
2835	4822 126 12785	47nF	20%	50V
2837	4822 124 40433	47μF	20%	25V
2838	4822 124 41579	10μF	20%	50V
2839	4822 124 40433	47μF	20%	25V
2840	4822 126 12882	100nF	20%	50V
2841	4822 126 12702	270pF	10%	50V
2842	4822 126 12339	2,2nF	10%	16V
2844	4822 126 12702	270pF	10%	50V
2849	4822 124 40246	4,7μF	20%	63V
2850	4822 122 33197	1nF	10%	50V
2851	4822 124 40196	220μF	20%	16V
2852	4822 126 12785	47nF	20%	50V
2853	4822 126 11585	22nF	20%	50V
2854	4822 126 12785	47nF	20%	50V
2855	4822 122 33519	470pF	10%	50V
2856	4822 122 33848	47pF	5%	50V
2857	4822 121 51387	10nF	20%	16V
2858	4822 124 40196	220μF	20%	16V
2859	4822 121 51387	10nF	20%	16V
2860	4822 124 41579	10μF	20%	50V
2861	4822 124 41579	10μF	20%	50V
2862	4822 122 10466	220pF	10%	50V
2863	4822 122 10466	220pF	10%	50V
2864	4822 122 33191	22pF	5%	50V
2865	4822 126 11585	22nF	20%	50V
2867	4822 122 10466	220pF	10%	50V
2869	4822 126 12785	47nF	20%	50V

CAPACITORS

2872	4822 126 12785	47nF	20%	50V
2873	4822 124 12233	47μF	20%	25V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 40196	220μF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 126 12785	47nF	20%	50V
2882	4822 122 10466	220pF	10%	50V
2884	4822 124 40246	4,7μF	20%	63V
2885	4822 124 40246	4,7μF	20%	63V
2887	4822 126 12882	100nF	20%	50V
2888	4822 124 40246	4,7μF	20%	63V
2891	4822 122 10576	1,8nF	10%	16V
2892	4822 126 11714	4,7nF	20%	16V
2893	4822 122 10466	220pF	10%	50V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 83872	220Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3709	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3712	4822 116 52176	10Ω	5%	0,5W
3713	4822 116 52257	22kΩ	5%	0,5W
3714	4822 116 83864	10kΩ	5%	0,5W
3715	4822 116 52234	100kΩ	5%	0,5W
3716	4822 116 83883	470Ω	5%	0,16W
3718	4822 116 52283	4,7kΩ	5%	0,5W
3727	4822 116 52283	4,7kΩ	5%	0,5W
3728	4822 116 52283	4,7kΩ	5%	0,5W
3730	4822 116 52271	33kΩ	5%	0,16W
3731	4822 116 83864	10kΩ	5%	0,5W
3740	4822 116 52257	22kΩ	5%	0,5W
3741	4822 116 52257	22kΩ	5%	0,5W
3742	4822 116 52257	22kΩ	5%	0,5W
3743	4822 116 52257	22kΩ	5%	0,5W
3744	4822 116 83864	10kΩ	5%	0,5W
3746	4822 116 83864	10kΩ	5%	0,5W
3750	4822 050 11002	1kΩ	5%	0,2W
3751	4822 050 11002	1kΩ	5%	0,2W
3800	4822 116 52291	56kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52291	56kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 83876	270Ω	5%	0.16W
3811	4822 116 52251	18kΩ	5%	0,5W
3812	4822 053 10228	2,2Ω	5%	1W
3814	4822 116 52191	33Ω	5%	0,5W
3815	4822 052 10478	4,7Ω	5%	NFR
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52283	4,7kΩ	5%	0,5W
3821	4822 116 52283	4,7kΩ	5%	0,5W
3822	4822 116 52249	1,8kΩ	5%	0,16W
3823	4822 050 11002	1kΩ	5%	0,2W
3824	4822 050 11002	1kΩ	5%	0,2W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52271	33kΩ	5%	0,16W

ELECTRICAL PARTSLIST 3CDC-99 MODULE

RESISTORS

3828	4822 116 52257	22kΩ	5%	0.5W
3831	4822 116 52257	22kΩ	5%	0.5W
3832	4822 116 83864	10kΩ	5%	0.5W
3833	4822 116 52257	22kΩ	5%	0.5W
3834	4822 116 52257	22kΩ	5%	0.5W
3835	4822 052 10338	3,3Ω		NFR25
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0.2W
3839	4822 116 52234	100kΩ	5%	0.5W
3840	4822 116 52234	100kΩ	5%	0,5W
3841	4822 116 52283	4,7kΩ	5%	0,5W
3842	4822 116 83884	47kΩ	5%	0.16W
3843	4822 116 52271	33kΩ	5%	0.16W
3844	4822 116 52283	4,7kΩ	5%	0.5W
3845	4822 116 83884	47kΩ	5%	0.16W
3846	4822 116 52271	33kΩ	5%	0,16W
3847	4822 116 83961	6.8kΩ	5%	0.16W
3848	4822 116 52234	100kΩ	5%	0.5W
3849	4822 116 52234	100kΩ	5%	0,5W
3850	4822 116 52276	3,9kΩ	5%	0,5W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 116 83883	470Ω	5%	0,16W
3854	4822 116 52175	100Ω	5%	0,5W
3855	4822 116 52175	100Ω	5%	0,5W
3857	4822 116 52191	33Ω	5%	0,5W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83864	10kΩ	5%	0,5W
3861	4822 116 83864	10kΩ	5%	0,5W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52191	33Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3866	4822 116 83864	10kΩ	5%	0,5W
3867	4822 116 83868	150Ω	5%	0,5W
3869	4822 050 24708	4,7Ω	1%	0,6W
3870	4822 116 52175	100Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83864	10kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 116 83883	470Ω	5%	0,16W
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W
3892	4822 116 83883	470Ω	5%	0,16W
3893	4822 116 83883	470Ω	5%	0,16W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3897	4822 116 52175	100Ω	5%	0,5W
3899	4822 116 52175	100Ω	5%	0,5W

COILS

1810	4822 242 10849	QUARTZ 8.46MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5802	4822 156 31058	FILTER DIGITAL OUT

DIODES

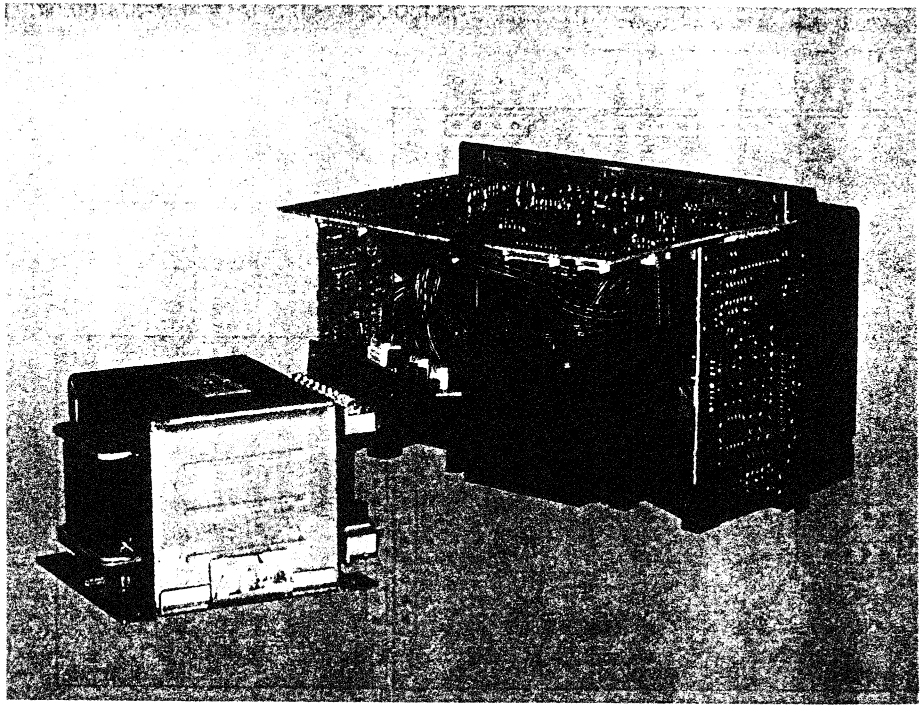
6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1
6877	4822 130 31981	BZX79-C3V9

TRANSISTORS

7812	4822 130 40959	BC547B
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7801 ©	4822 209 17286	TZA1024T/N1 HF-AMPLIFIER
7805	4822 209 17284	TDA1308 OPAMP
7806	4822 209 32852	TDA7073A/N2 SERVO DRIVER
7807	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7871	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7873	5322 209 10421	HEF4094BP SHIFT REGISTER
7876 ©	4822 209 16143	LC89170M CD TEXT
7877 ©	4822 209 17285	SAA7324H/M1 SIGNAL PROCESSOR



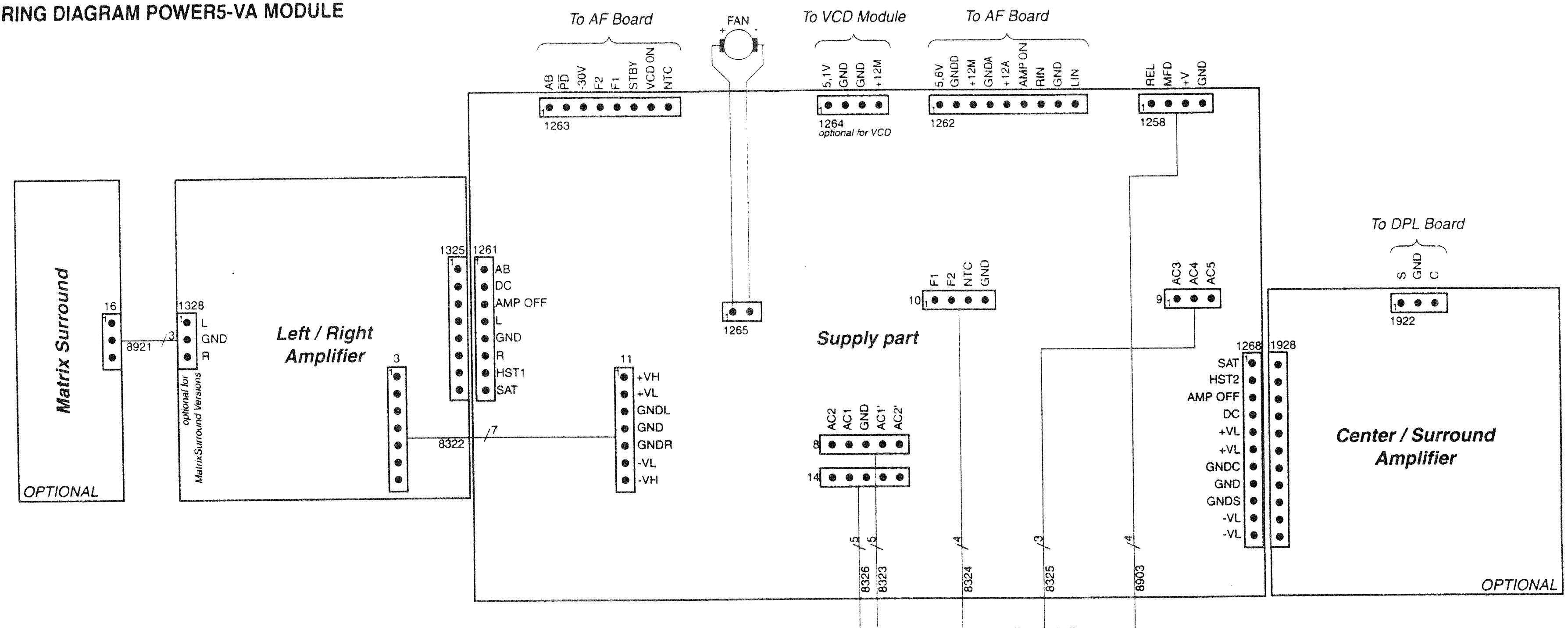
POWER 5-VA Module

(70 / 100W Version)

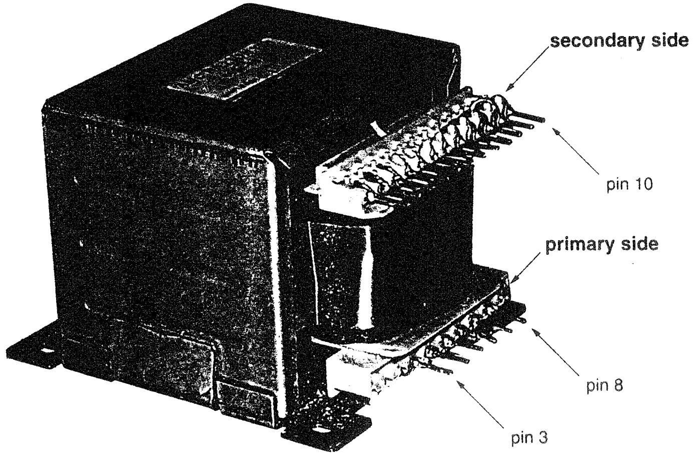
TABLE OF CONTENTS

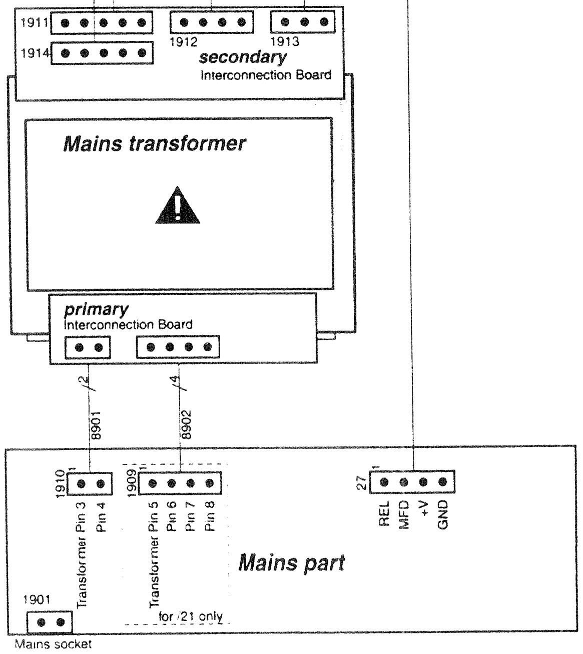
Wiring Diagram 11-2
Block Diagram 11-3
Component layout Supply part and L/R Amplifier part 11-4
Circuit Diagram Mains part and Supply part 11-5
Component layout Mains part 11-6
Component layout Supply part and L/R Amplifier part 11-6
Circuit diagram L/R Amplifier part 11-7
Exploded view 11-8
Partslist 11-9ff

WIRING DIAGRAM POWER5-VA MODULE


To AF Board
AB
PD
-30V
F2
F1
STBY
VCD ON
NTC
1263
FAN
+
-
1265
To VCD Module
5,1V
GND
GND
+12M
1264
optional for VCD
To AF Board
5,6V
GNDD
+12M
GNDA
+12A
AMP ON
RIN
GND
LIN
1262
REL
MFD
+V
GND
1258
Matrix Surround
16
8921
3
OPTIONAL
1328
L
GND
R
optional for MatrixSurround Versions
Left / Right Amplifier
3
8322
7
1325
1261
AB
DC
AMP OFF
L
GND
R
HST1
SAT
11
+VH
+VL
GNDL
GND
GNDR
-VL
-VH
Supply part
F1
F2
NTC
GND
10
AC3
AC4
AC5
9
AC2
AC1
GND
AC1'
AC2'
8
14
5
5
4
3
4
8326
8323
8324
8325
8903
1268
1928
SAT
HST2
AMP OFF
DC
+VL
+VL
GNDC
GND
GNDS
-VL
-VL
To DPL Board
S
GND
C
1922
Center / Surround Amplifier
OPTIONAL

Mains Transformer /21

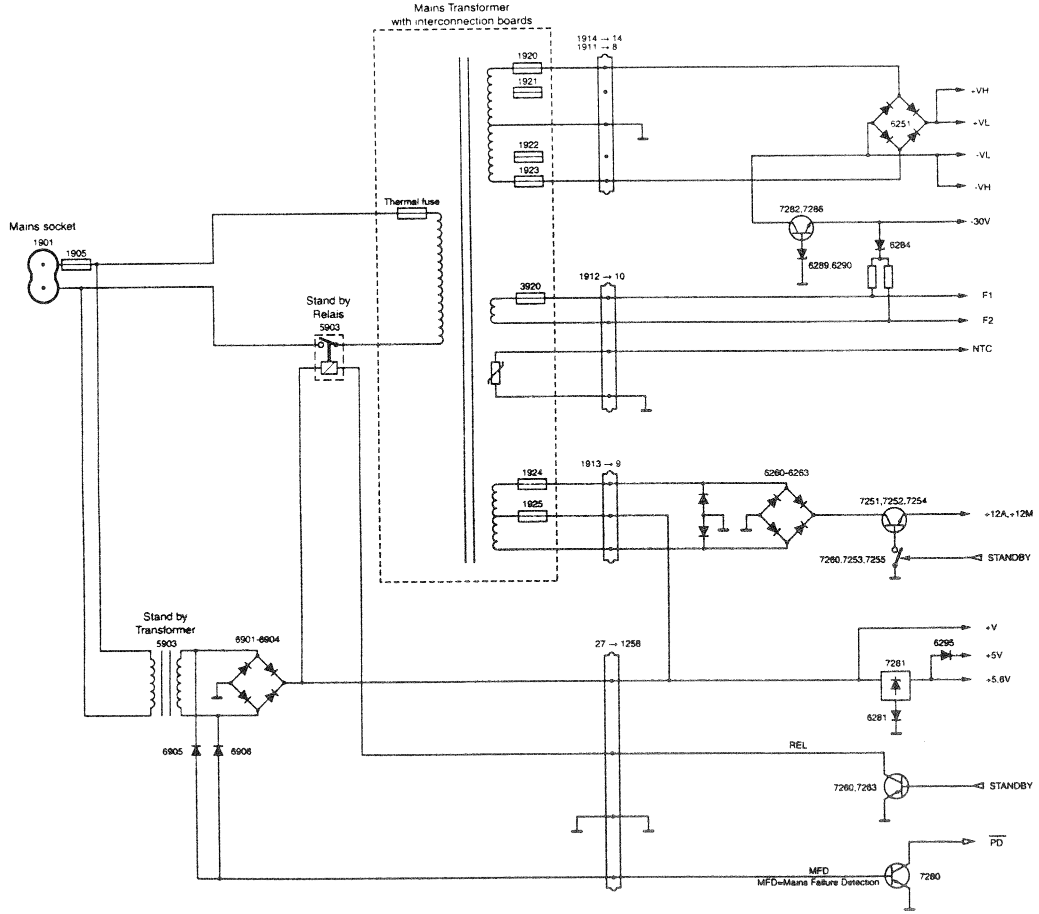

secondary side
pin 10
primary side
pin 8
pin 3


1911
1914
1912
1913
secondary
Interconnection Board
Mains transformer
primary
Interconnection Board
2
4
8901
8902
1910
Transformer Pin 3
Pin 4
1909
Transformer Pin 5
Pin 6
Pin 7
Pin 8
for /21 only
27
REL
MFD
+V
GND
Mains part
1901
Mains socket

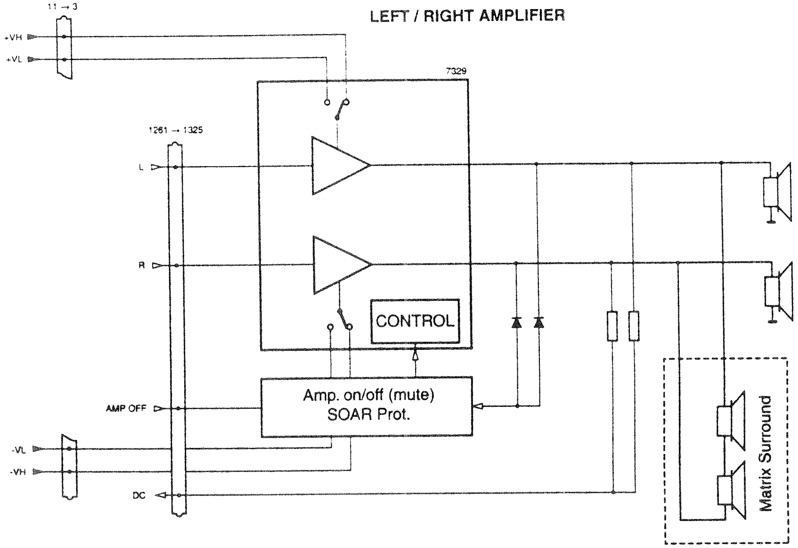
Power5 VA Wiring Diagram 22.01.1999

BLOCK DIAGRAM 70/100W VERSION

SUPPLY PART


Mains Transformer
with interconnection boards
1914 → 14
1911 → 8
1920
1921
1922
1923
+VH
+VL
6251
-VL
-VH
Thermal fuse
Mains socket
1901
1905
7282,7286
-30V
6284
6289,6290
Stand by
Relais
5903
3920
1912 → 10
F1
F2
NTC
1924
1925
1913 → 9
6260-6263
7251,7252,7254
+12A,+12M
7260,7253,7255
STANDBY
Stand by
Transformer
5903
6901-6904
27 → 1258
+V
6295
+5V
7281
+5.6V
6281
6905
6906
REL
7260,7263
STANDBY
PD
MFD
MFD=Mains Failure Detection
7280

LEFT / RIGHT AMPLIFIER


11 → 3
+VH
+VL
7329
1261 → 1325
L
R
CONTROL
AMP OFF
Amp. on/off (mute)
SOAR Prot.
-VL
-VH
DC
Matrix Surround

COMPONENT LAYOUT SUPPLY PART & L/R AMPLIFIER PART

9367 A 3
9368 A 3
9369 A 3
9370 A 2

T312 A 7
T314 A 10
T315 B 9
T316 A 10
—
16 A 4
1327 A 4
2357 A 5
3381 A 4
9360 A 2
9361 A 2
9362 A 2
9363 A 2
9364 A 4
9365 A 3
9366 A 3

9304 B 12
9305 A 10
9306 B 12
9307 B 10
9308 C 9
9309 B 8
9312 A 9
9313 A 8
9314 A 9
9315 B 9
9316 D 13
T256 C 13
T257 C 12
T258 D 13
T265 B 10
T305 A 11

9280 D 10
9281 D 10
9284 C 12
9285 C 12
9286 C 9
9287 C 10
9288 D 10
9289 B 11
9290 C 10
9291 C 9
9292 C 11
9298 E 8
9299 B 12
9300 B 12
9302 A 11
9303 B 11

9264 A 11
9265 E 12
9266 E 12
9267 E 12
9268 E 13
9269 E 12
9270 A 10
9271 E 11
9272 A 11
9273 E 12
9274 A 13
9275 C 10
9276 D 9
9277 B 11
9278 E 9
9279 E 10

7286 B 9
7290 D 7
7292 E 12
8328 C 9
9251 E 9
9252 E 8
9253 E 12
9254 C 7
9255 B 7
9256 E 12
9258 A 7
9259 B 9
9260 A 10
9261 A 12
9262 A 8
9263 A 11

7252 C 12
7253 A 8
7254 D 12
7255 C 12
7260 A 8
7262 B 13
7263 A 13
7265 A 7
7266 B 7
7268 A 7
7280 A 12
7281 E 11
7282 B 10
7283 A 10
7284 A 11
7285 A 11

6286 B 8
6287 B 8
6288 B 8
6289 B 10
6290 B 10
6292 D 7
6293 B 12
6294 B 13
6295 A 10
6296 A 9
6297 A 9
6298 B 7
6299 B 7
6301 B 11
6302 B 7
7251 E 13

6255 E 9
6260 D 13
6261 D 13
6262 C 13
6263 C 13
6264 C 11
6265 A 13
6267 A 13
6269 B 11
6270 B 12
6271 C 12
6272 A 10
6281 E 12
6283 B 11
6284 B 10
6285 B 8

3305 C 9
3306 A 8
3308 A 10
3309 B 7
3310 A 9
3311 A 10
3312 B 9
3313 B 12
3315 A 8
3316 A 8
3317 A 13
3318 A 9
3319 A 7
3320 A 7
6251 E 10
6252 B 13

3283 D 11
3284 D 11
3285 B 9
3286 B 10
3287 B 11
3288 B 10
3289 B 10
3290 E 8
3295 D 7
3298 D 7
3299 D 7
3300 D 7
3301 B 7
3302 B 7
3303 E 13
3304 B 9

3263 B 12
3265 B 12
3266 A 8
3267 A 8
3268 A 10
3270 C 12
3271 D 7
3272 E 13
3273 B 8
3274 E 8
3275 D 8
3278 D 13
3279 E 12
3280 A 13
3281 C 12
3282 C 7

2303 A 7
3248 A 11
3249 A 11
3250 A 11
3251 D 13
3252 D 12
3253 A 13
3254 B 7
3255 E 13
3256 B 13
3257 E 12
3258 E 12
3259 A 12
3260 C 12
3261 C 11
3262 C 12

2279 D 12
2280 C 12
2281 C 12
2282 D 11
2283 A 11
2284 C 8
2285 B 9
2286 A 10
2287 B 9
2288 A 13
2289 A 13
2290 D 7
2295 C 12
2300 B 7
2301 B 8
2302 A 9

2256 D 9
2257 D 8
2258 C 8
2259 D 10
2260 D 11
2261 C 11
2262 C 11
2263 B 13
2264 D 13
2265 C 13
2266 C 13
2267 D 12
2268 C 12
2269 C 12
2270 B 9
2271 A 12

14 D 9
1258 A 13
1261 C 8
1262 A 12
1263 A 7
1264 A 10
1265 C 9
1268 D 13
1280 C 7
1290 E 11
1291 C 9
2251 D 10
2252 E 10
2253 D 10
2254 D 9
2255 E 9

9349 B 2
9350 C 2
9351 D 5
9353 C 5
9354 C 2
9355 B 5
9356 D 5
9357 D 5
9358 E 4
9359 E 4
T321 A 1
—
8 D 9
9 B 13
10 B 10
11 D 8

9329 C 3
9331 C 5
9332 B 5
9333 B 5
9335 E 4
9336 E 3
9337 E 3
9338 E 4
9340 C 3
9342 D 5
9343 B 1
9344 D 3
9345 C 4
9346 D 4
9347 C 2
9348 B 5

7325 E 1
7326 E 2
7327 D 1
7328 C 1
7329 D 4
7330 C 4
7350 D 2
8327 E 4
9321 B 1
9322 B 1
9323 B 3
9324 C 3
9325 D 3
9326 C 4
9327 D 3
9328 C 2

5324 E 5
6325 C 3
6326 C 4
6327 B 4
6328 C 3
6329 B 4
6330 C 3
6333 E 4
6334 E 4
6335 E 4
6336 E 4
6337 D 1
6339 D 1
6360 D 5
7323 C 1
7324 C 1

3372 E 3
3373 C 1
3376 C 1
3377 B 5
3378 B 5
3379 B 5
3380 B 5
3383 D 1
3384 D 1
3385 C 5
3386 D 5
3387 D 6
3388 D 6
5321 C 5
5322 E 5
5323 C 5

3351 D 2
3352 D 1
3353 D 1
3355 C 3
3356 C 3
3357 E 1
3358 E 2
3363 C 5
3364 D 5
3365 D 5
3366 D 5
3367 D 1
3368 C 1
3369 B 5
3370 E 5
3371 E 3

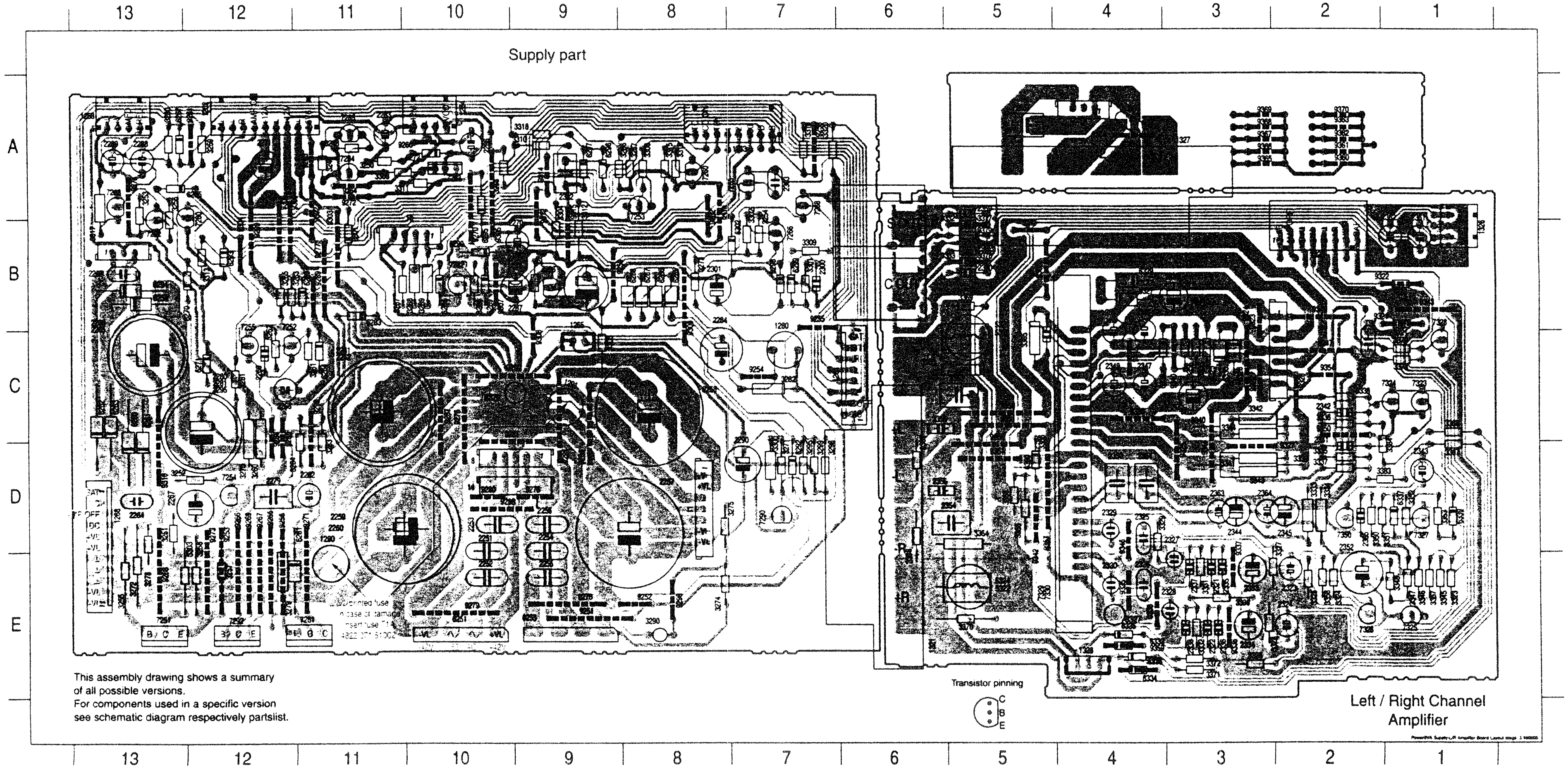
3334 D 2
3335 D 2
3336 C 2
3337 D 2
3338 C 2
3339 D 2
3340 C 2
3341 D 3
3342 C 3
3343 D 3
3344 C 3
3345 E 1
3346 E 1
3347 E 1
3348 E 1
3350 D 2

2364 D 3
2365 D 2
2366 C 5
3321 B 1
3322 B 1
3323 E 1
3324 E 2
3325 E 2
3326 E 3
3327 E 3
3328 E 3
3329 D 4
3330 E 3
3331 E 3
3332 E 3
3333 D 2

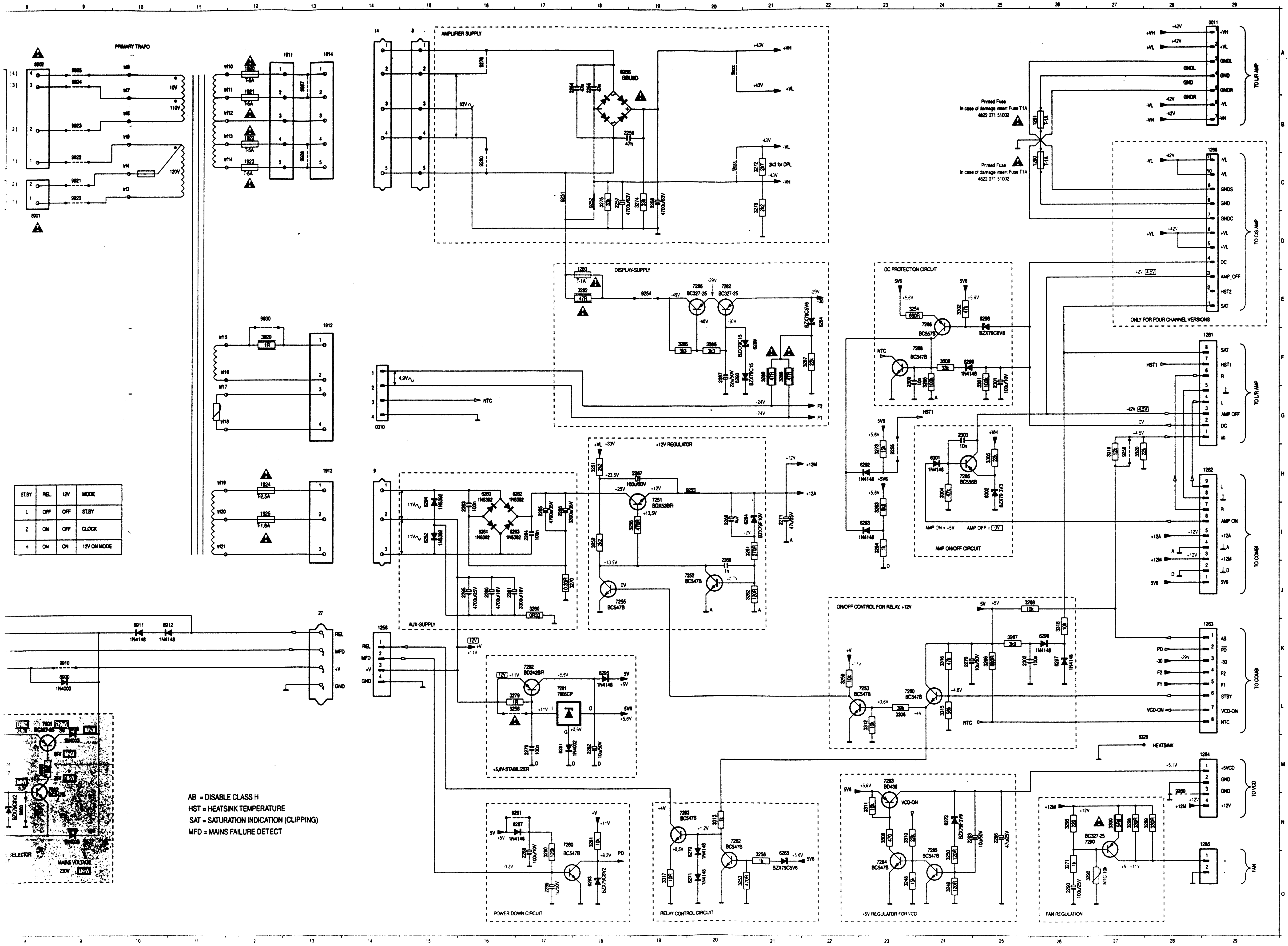
2346 C 4
2347 C 4
2348 C 4
2349 C 4
2350 D 4
2351 D 4
2352 E 2
2353 C 5
2354 D 5
2355 C 6
2356 D 6
2359 A 5
2360 B 5
2361 B 1
2362 B 1
2363 D 3

2329 D 4
2330 E 4
2331 C 2
2333 E 3
2334 E 3
2335 E 3
2336 E 3
2337 E 3
2338 E 3
2339 B 3
2340 C 3
2341 D 2
2342 C 2
2343 D 1
2344 D 3
2345 D 2

3 C 2
1321 D 6
1322 B 6
1323 B 6
1324 B 6
1325 B 2
1326 B 1
1328 E 4
2321 E 3
2322 E 3
2323 E 2
2324 E 2
2325 D 4
2326 E 4
2327 E 3
2328 E 3



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.


PRIMARY TRAFO
AMPLIFIER SUPPLY
DISPLAY-SUPPLY
+12V REGULATOR
AUX-SUPPLY
+5,8V-STABILIZER
DC PROTECTION CIRCUIT
AMP ON/OFF CIRCUIT
AMP ON = +5V AMP OFF = 0V
ON/OFF CONTROL FOR RELAY, +12V
POWER DOWN CIRCUIT
RELAY CONTROL CIRCUIT
+5V REGULATOR FOR VCD
FAN REGULATION
ONLY FOR FOUR CHANNEL VERSIONS
Printed Fuse In case of damage insert Fuse T1A 4822 071 51002
TO LR AMP
TO CS AMP
TO COMBI
TO VCD
FAN
HEATSINK
SELECTOR
MAINS VOLTAGE

ST.BY	REL	12V	MODE
L	OFF	OFF	ST.BY
Z	ON	OFF	CLOCK
H	ON	ON	12V ON MODE

AB = DISABLE CLASS H
HST = HEATSINK TEMPERATURE
SAT = SATURATION INDICATION (CLIPPING)
MFD = MAINS FAILURE DETECT

0010	G14
0011	B29
1258	K14
1261	F29
1262	H29
1263	M29
1264	M29
1265	N29
1266	B29
1280	E18
1290	C28
1291	B28
14	A14
1901	A 1
1905	A 3
1906	C 6
1907	C 6
1909	A 7
1910	D 7
1911	A13
1912	E13
1913	H13
1914	A13
1920	A12
1921	A12
1922	B12
1923	C12
1924	H12
1925	I12
2251	A16
2252	A16
2253	B17
2254	A18
2255	A18
2256	B19
2257	C18
2258	C19
2260	C20
2262	C20
2263	I16
2264	I17
2265	I17
2266	I17
2267	H19
2268	I20
2269	J20
2270	K24
2271	I21
2279	M17
2280	J16
2281	J16
2282	M18
2283	N24
2286	N25
2287	F20
2288	O17
2289	O17
2290	O26
2295	J16
2300	F23
2301	F25
2302	K25
2303	G24
27	J13
2802	L 6
2803	M 7
2804	N 7
2805	N 6
2806	N 7
3248	O23
3249	O24
3250	O24
3251	H18
3252	I18
3253	O20
3254	E24
3255	I19
3256	O21
3259	L22
3260	J17
3261	I21
3262	J21
3265	F24
3266	K25
3267	K25
3268	J26
3270	J18
3271	O26
3272	C21
3273	H23
3274	C19
3275	C18
3278	C21
3279	L17
3280	O17
3281	N18
3282	E18
3283	I23
3284	I23
3285	F19
3286	F20
3287	F22
3288	F21
3289	F21
3290	O26
3295	N26
3298	N27
3299	N28
3300	N27
3301	F25
3302	E24
3304	H24
3305	H25
3306	L23
3308	N23
3309	F24
3310	N23
3311	N23
3312	L23
3313	N20
3315	L24
3316	K24
3317	O19
3318	K26
3319	H27
3320	H27
3901	N 3
3902	K 5
3903	K 6
3904	M 7
3905	M 8
3906	N 5
3907	B 1
3920	F12
5901	B 2
5902	A 2
5903	L 4
5905	A 4
6251	A17
6252	I15
6255	A18
6260	H16
6261	I16
6262	H17
6263	I17
6264	I20
6265	N21
6267	N17
6270	O19
6271	O19
6272	N24
6281	M17
6283	I23
6284	E22
6289	F21
6290	F20
6292	H23
6293	O18
6294	H15
6295	K18
6296	K26
6297	K26
6298	E25
6299	F24
6301	H24
6302	H25
6900	K 9
6901	L 6
6902	M 6
6903	L 7
6904	M 6
6905	L 5
6906	L 5
6908	N 8
6909	L 9
6910	N 9
6911	K10
6912	K11
7251	H19
7252	J20
7253	L23
7255	J18
7260	L24
7262	N20
7263	N20
7265	H24
7266	E24
7268	F24
7280	N17
7281	L17
7282	E20
7283	M23
7284	O23
7285	O24
7286	E20
7290	N26
7292	K17
7901	L 8
7902	M 8
8	A15
8901	D 8
8902	A 8
9	H14
9251	C17
9252	C18
9253	H20
9254	E19
9255	H23
9256	L17
9258	H27
9260	N28
9261	N17
9276	A16
9280	C16
9900	N 8
9901	A 2
9902	B 2
9903	A 3
9904	B 4
9905	C 6
9906	B 6
9910	K 9
9911	F 1
9912	G 1
9913	G 1
9914	G 1
9915	B 6
9916	C 4
9917	C 5
9918	C 3
9920	C 9
9921	C 9
9922	C 9
9923	B 9
9924	A 9
9925	A 9
9927	A13
9928	C13
9930	E12
trf10	A11
trf11	A11
trf12	B11
trf13	B11
trf14	C11
trf15	F12
trf16	F11
trf17	G12
trf18	G11
trf19	H11
trf20	I11
trf21	I11
trf3	C10
trf4	C10
trf5	B10
trf6	B10
trf7	A10
trf8	A10

COMPONENT LAYOUT SUPPLY PART & L/R AMPLIFIER PART

9367 A 3
9368 A 3
9369 A 3
9370 A 2

T312 A 7
T314 A 10
T315 B 9
T316 A 10
---
16 A 4
1327 A 4
2357 A 5
3381 A 4
9360 A 2
9361 A 2
9362 A 2
9363 A 2
9364 A 4
9365 A 3
9366 A 3

9304 B 12
9305 A 10
9306 B 12
9307 B 10
9308 C 9
9309 E 8
9312 A 9
9313 A 8
9314 A 9
9315 E 9
9316 D 13
T256 C 13
T257 C 12
T258 D 13
T265 B 10
T305 A 11

9280 D 10
9281 D 10
9284 C 12
9285 C 12
9286 C 9
9287 C 10
9288 D 10
9289 B 11
9290 C 10
9291 C 9
9292 C 11
9298 E 8
9299 B 12
9300 B 12
9302 A 11
9303 B 11

9264 A 11
9265 E 12
9266 E 12
9267 E 12
9268 E 13
9269 E 12
9270 A 10
9271 E 11
9272 A 11
9273 E 12
9274 A 13
9275 C 10
9276 D 9
9277 B 11
9278 E 9
9279 E 10

7286 B 9
7290 D 7
7292 E 12
8328 C 9
9251 E 9
9252 E 8
9253 E 12
9254 C 7
9255 B 7
9256 E 12
9258 A 7
9259 B 9
9260 A 10
9261 A 12
9262 A 8
9263 A 11

7252 C 12
7253 A 8
7254 D 12
7255 C 12
7260 A 8
7262 B 13
7263 A 13
7265 A 7
7266 B 7
7268 A 7
7280 A 12
7281 E 11
7282 B 10
7283 A 10
7284 A 11
7285 A 11

6286 B 8
6287 B 8
6288 B 8
6289 B 10
6290 B 10
6292 D 7
6293 B 12
6294 B 13
6295 A 10
6296 A 9
6297 A 9
6298 B 7
6299 B 7
6301 B 11
6302 B 7
7251 E 13

6255 E 9
6260 D 13
6261 D 13
6262 C 13
6263 C 13
6264 C 11
6265 A 13
6267 A 13
6269 B 11
6270 B 12
6271 C 12
6272 A 10
6281 E 12
6283 B 11
6284 B 10
6285 B 8

3305 C 9
3306 A 8
3308 A 10
3309 B 7
3310 A 9
3311 A 10
3312 B 9
3313 B 12
3315 A 8
3316 A 8
3317 A 13
3318 A 9
3319 A 7
3320 A 7
6251 E 10
6252 B 13

3283 D 11
3284 D 11
3285 B 9
3286 B 10
3287 B 11
3288 B 10
3289 B 10
3290 E 8
3295 D 7
3298 D 7
3299 D 7
3300 D 7
3301 B 7
3302 B 7
3303 E 13
3304 B 9

3263 B 12
3265 B 12
3266 A 8
3267 A 8
3268 A 10
3270 C 12
3271 D 7
3272 E 13
3273 B 8
3274 E 8
3275 D 8
3278 D 13
3279 E 12
3280 A 13
3281 C 12
3282 C 7

2303 A 7
3248 A 11
3249 A 11
3250 A 11
3251 D 13
3252 D 12
3253 A 13
3254 B 7
3255 E 13
3256 B 13
3257 E 12
3258 E 12
3259 A 12
3260 C 12
3261 C 11
3262 C 12

2279 D 12
2280 C 12
2281 C 12
2282 D 11
2283 A 11
2284 C 8
2285 B 9
2286 A 10
2287 B 9
2288 A 13
2289 A 13
2290 D 7
2295 C 12
2300 B 7
2301 B 8
2302 A 9

2256 D 9
2257 D 8
2258 C 8
2259 D 10
2260 D 11
2261 C 11
2262 C 11
2263 B 13
2264 D 13
2265 C 13
2266 C 13
2267 D 12
2268 C 12
2269 C 12
2270 B 9
2271 A 12

14 D 9
1258 A 13
1261 C 6
1262 A 12
1263 A 7
1264 A 10
1265 C 9
1268 D 13
1280 C 7
1290 E 11
1291 C 9
2251 D 10
2252 E 10
2253 D 10
2254 D 9
2255 E 9

9349 B 2
9350 C 2
9351 D 5
9353 C 5
9354 C 2
9355 B 5
9356 D 5
9357 D 5
9358 E 4
9359 E 4
T321 A 1
---
8 D 9
9 B 13
10 B 10
11 D 8

9329 C 3
9331 C 5
9332 B 5
9333 B 5
9335 E 4
9336 E 3
9337 E 3
9338 E 4
9340 C 3
9342 D 5
9343 B 1
9344 D 3
9345 C 4
9346 D 4
9347 C 2
9348 B 5

7325 E 1
7326 E 2
7327 D 1
7328 C 1
7329 D 4
7330 C 4
7350 D 2
8327 E 4
9321 B 1
9322 B 1
9323 B 3
9324 C 3
9325 D 3
9326 C 4
9327 D 3
9328 C 2

5324 E 5
6325 C 3
6326 C 4
6327 B 4
6328 C 3
6329 B 4
6330 C 3
6333 E 4
6334 E 4
6335 E 4
6336 E 4
6337 D 1
6339 D 1
6360 D 5
7323 C 1
7324 C 1

3372 E 3
3373 C 1
3376 C 1
3377 B 5
3378 B 5
3379 B 5
3380 B 5
3383 D 1
3384 D 1
3385 C 5
3386 D 5
3387 D 6
3388 D 6
5321 C 5
5322 E 5
5323 C 5

3351 D 2
3352 D 1
3353 D 1
3355 C 3
3356 C 3
3357 E 1
3358 E 2
3363 C 5
3364 D 5
3365 D 5
3366 D 5
3367 D 1
3368 C 1
3369 B 5
3370 E 5
3371 E 3

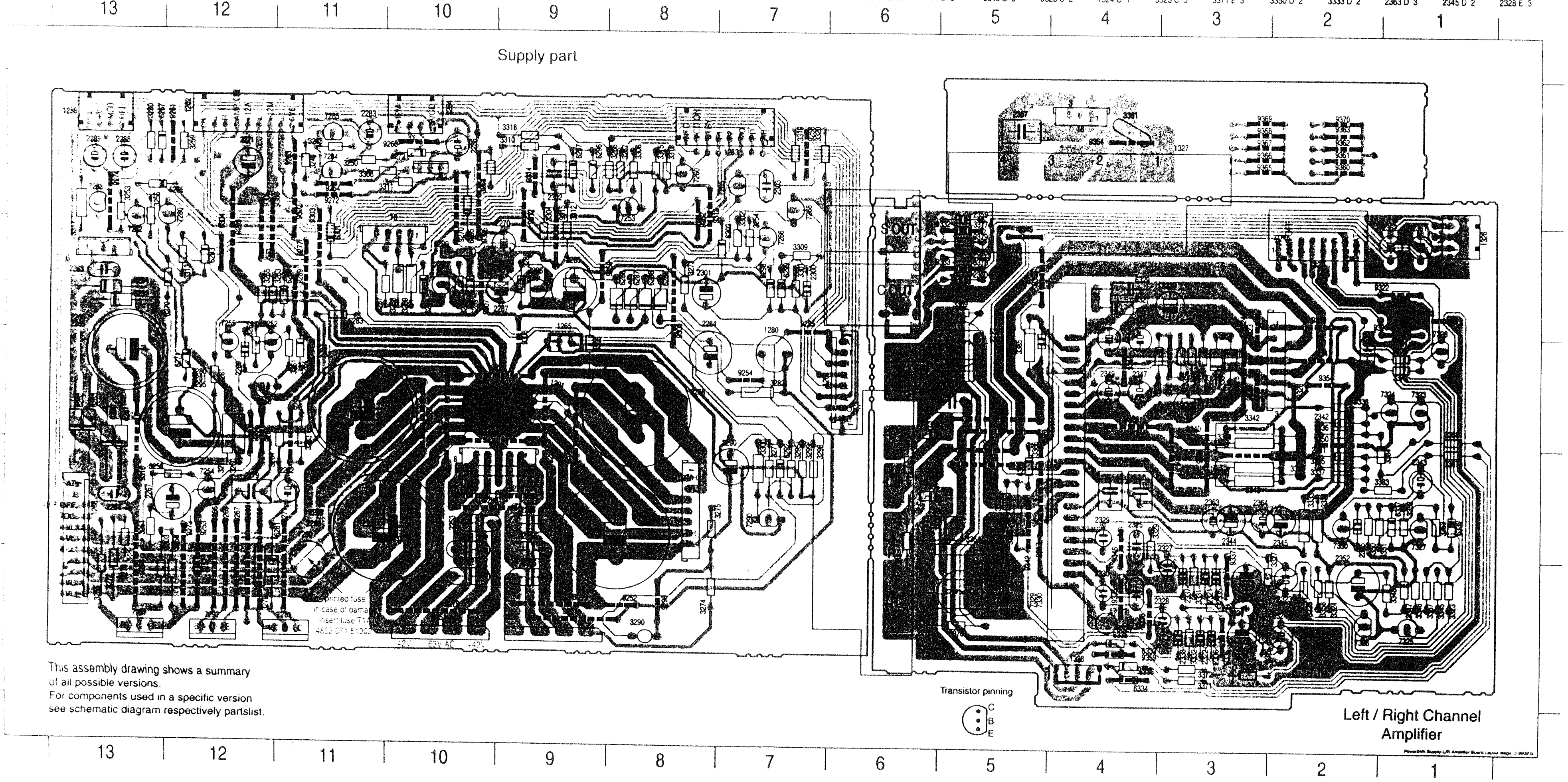
3334 D 2
3335 D 2
3336 C 2
3337 D 2
3338 C 2
3339 D 2
3340 C 2
3341 D 3
3342 C 3
3343 D 3
3344 C 3
3345 E 1
3346 E 1
3347 E 1
3348 E 1
3350 D 2

2364 D 3
2365 D 2
2366 C 5
3321 B 1
3322 B 1
3323 E 1
3324 E 2
3325 E 2
3326 E 3
3327 E 3
3328 E 3
3329 D 4
3330 E 3
3331 E 3
3332 E 3
3333 D 2

2346 C 4
2347 C 4
2348 C 4
2349 C 4
2350 D 4
2351 D 4
2352 E 2
2353 C 5
2354 D 5
2355 C 6
2356 D 6
2359 A 5
2360 B 5
2361 B 1
2362 B 1
2363 D 3

2329 D 4
2330 E 4
2331 C 2
2333 E 3
2334 E 3
2335 E 3
2336 E 3
2337 E 3
2338 E 3
2339 B 3
2340 C 3
2341 D 2
2342 C 2
2343 D 1
2344 D 3
2345 D 2

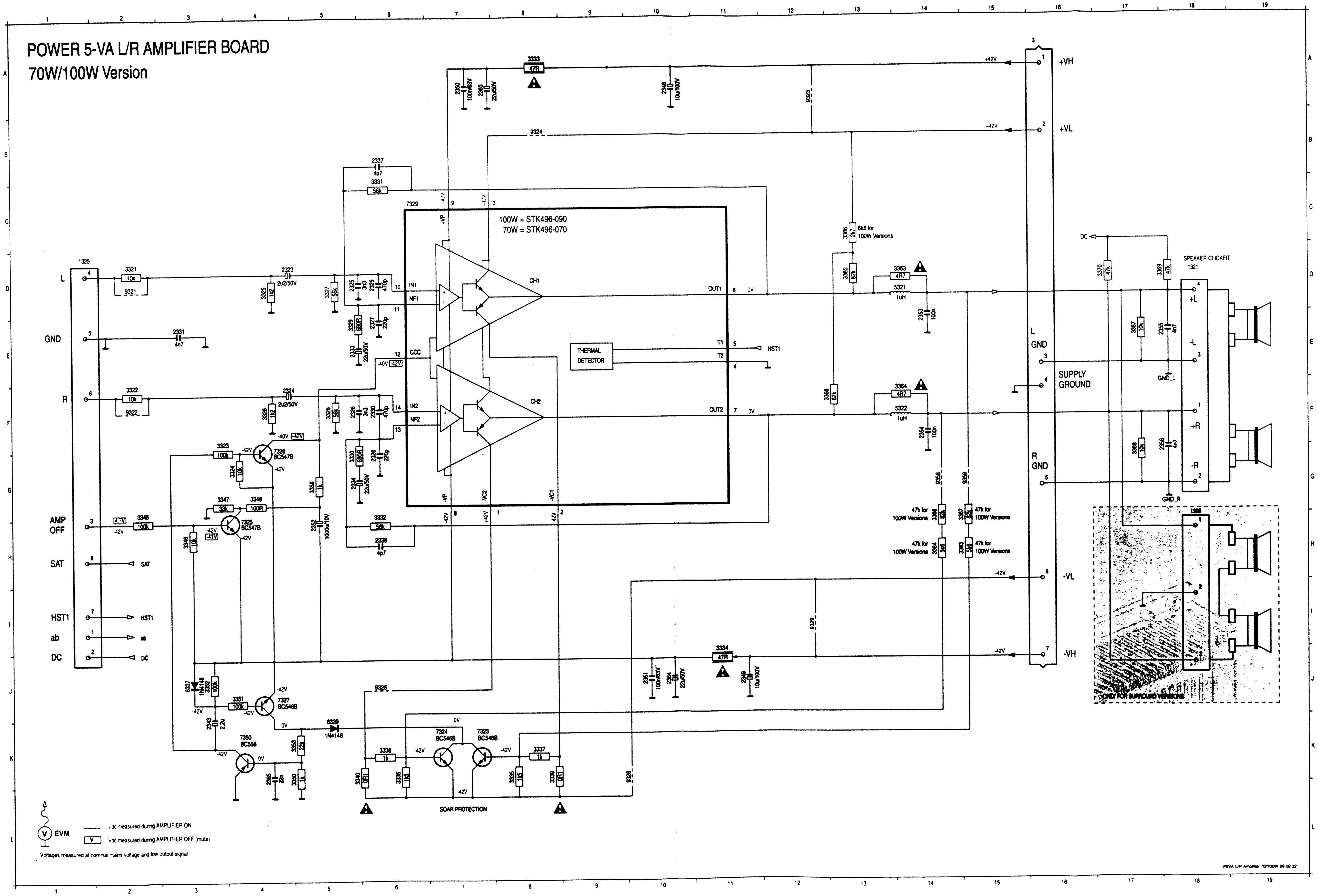
3 C 2
1321 D 6
1322 B 6
1323 B 6
1324 B 6
1325 B 2
1326 B 1
1328 E 4
2321 E 3
2322 E 3
2323 E 2
2324 E 2
2325 D 4
2326 E 4
2327 E 3
2328 E 3



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

11-7

POWER 5-VA L/R AMPLIFIER BOARD
70W/100W Version


1325
L
GND
R
AMP
OFF
SAT
HST1
ab
DC
3321 10k
9321
3322 10k
9322
2323 2u2/50V
2324 2u2/50V
3325 1k2
3326 1k2
3327 56k
3328 56k
2325 3n3
2326 3n3
2329 470p
2330 470p
2327 220p
2328 220p
3329 680R
3330 680R
2333 22u/50V
2334 22u/50V
2331 4n7
2337 4p7
3331 56k
2338 4p7
3332 56k
3323 100k
3324 10k
7326 BC547B
3347 33k
3348 100R
3345 100k
4.7V
-42V
-41V
-40V
3346 10k
7325 BC547B
3358 1k
2352 1000u/10V
6337 1N4148
3352 100k
3351 100k
7327 BC546B
2343 2,2u
7350 BC556
2365 22n
3350 1k
3353 22k
6339 1N4148
9326
3338 1k
3337 1k
7324 BC546B
7323 BC546B
3340 0R1
3336 1k5
3335 1k5
3339 0R1
SOAR PROTECTION
9328
7329
100W = STK496-090
70W = STK496-070
+VP
-VP
-VC2
-VC1
IN1
NF1
CCC
IN2
NF2
CH1
CH2
OUT1
OUT2
T1
T2
THERMAL DETECTOR
0V
+42V
2350 100n/63V
2363 22u/50V
3333 47R
2348 10u/100V
9323
9324
3386 2k7
6k8 for 100W Versions
3365 82k
3366 82k
3363 4R7
3364 4R7
5321 1uH
5322 1uH
2353 100n
2354 100n
9358
9359
47k for 100W Versions
3368 82k
3367 82k
3384 5k6
3383 5k6
+VH
+VL
L GND
SUPPLY GROUND
R GND
-VL
-VH
9329
3334 47R
2351 100n/63V
2364 22u/50V
2349 10u/100V
DC
3370 47k
3369 47k
SPEAKER CLICKFIT
1321
+L
-L
+R
-R
3387 10k
3388 10k
2355 4n7
2356 4n7
GND_L
GND_R
1328
ONLY FOR SURROUND VERSIONS
A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

EVM

Vdc measured during AMPLIFIER ON

V Vdc measured during AMPLIFIER OFF (mute)

Voltages measured at nominal mains voltage and low output signal

PSVA L/R Amplifier 70/100W 99 02 22

1321	D18
1325	D 1
1328	G18
2321	B 6
2322	H 6
2323	D 4
2324	F 4
2325	D 5
2326	F 5
2327	E 6
2328	G 6
2329	D 6
2330	F 6
2331	E 3
2333	E 5
2334	G 5
2335	B 6
2336	H 6
2337	B 6
2338	H 6
2341	K 7
2342	K 6
2343	K 3
2344	A 8
2345	J10
2346	B10
2347	I11
2348	A10
2349	J11
2350	A 7
2351	J10
2352	H 5
2353	E14
2354	F14
2355	E18
2356	G18
2363	A 7
2364	J10
2365	K 4
2366	C12
3	A16
3321	D 2
3322	F 2
3323	F 3
3324	G 4
3325	D 4
3326	F 4
3327	D 5
3328	F 5
3329	E 5
3330	G 5
3331	C 6
3332	H 6
3333	A 8
3334	J11
3335	K 8
3336	K 6
3337	K 8
3338	K 6
3339	K 8
3340	K 5
3345	G 2
3346	H 3
3347	G 3
3348	G 4
3350	K 5
3351	J 4
3352	J 3
3353	K 5
3355	C12
3356	I12
3358	G 5
3363	D14
3364	E14
3365	D13
3366	F13
3367	H15
3368	H14
3369	D18
3370	D17
3383	H15
3384	H14
3385	D12
3386	C13
3387	E17
3388	G17
5321	D14
5322	F14
5323	D14
5324	F14
6325	B12
6326	I12
6327	A13
6328	I13
6329	A13
6330	I13
6333	G14
6334	G14
6337	J 3
6339	K 5
6360	C12
7323	K
7324	K
7325	H
7326	G
7327	J
7329	C
7350	K
9321	D
9322	F
9323	A12
9324	J
9325	J
9326	J
9327	K
9328	K10
9329	I12
9331	D12
9358	G14
9359	G15

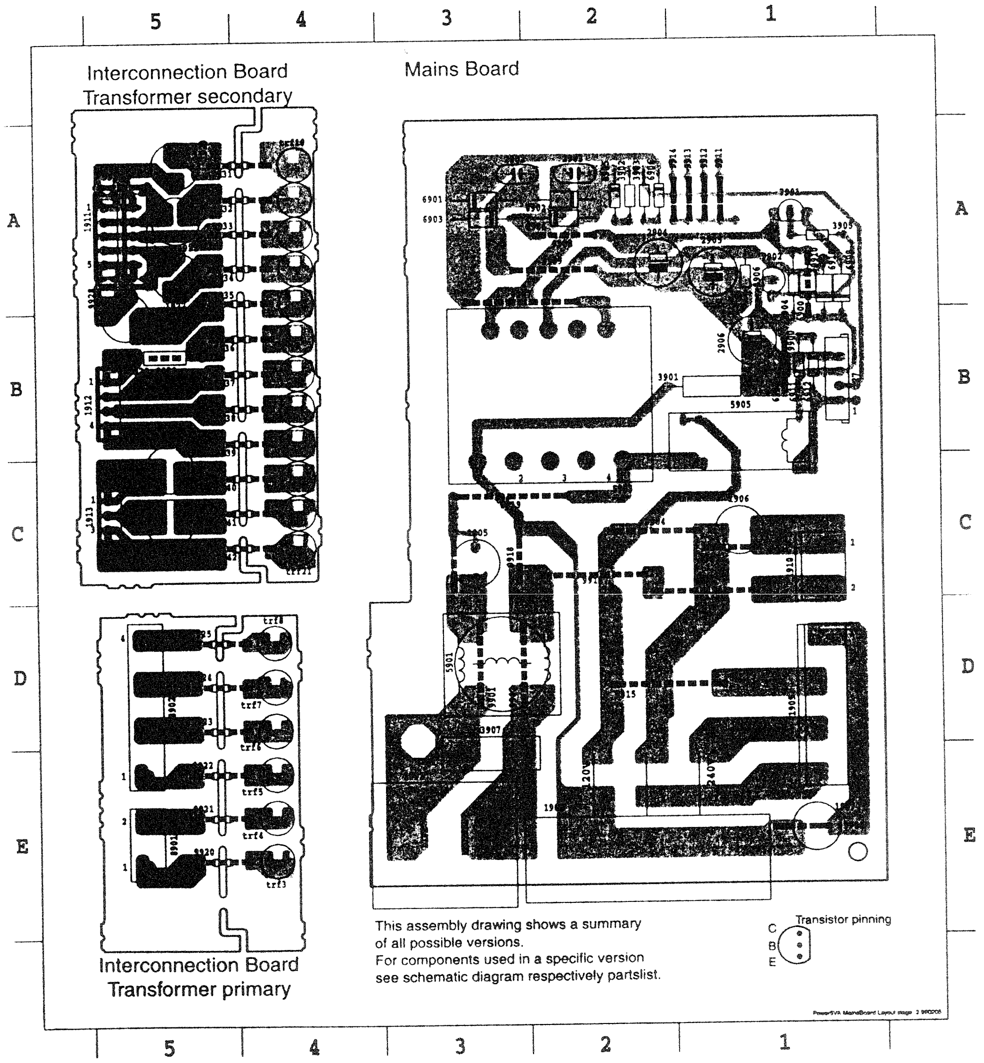
COMPONENT LAYOUT MAINS BOARD

Interconnection Board

primary side	secondary side		
8901 E 5	1911 A 5	9930 B 4	trf10 A 3
8902 D 5	1912 B 5	9931 A 4	trf11 A 3
9920 E 4	1913 C 5	9932 A 4	trf12 A 3
9921 E 4	1914 A 5	9933 A 4	trf13 A 3
9922 E 4	1920 A 4	9934 A 4	trf14 B 3
9923 D 4	1921 A 4	9935 B 4	trf15 B 3
9924 D 4	1922 A 4	9936 B 4	trf16 B 3
9925 D 4	1923 B 5	9937 B 4	trf17 B 3
trf3 E 4	1924 C 4	9938 B 4	trf18 C 3
trf4 E 4	1925 C 4	9939 C 4	trf19 C 3
trf5 E 4	3920 B 4	9940 C 4	trf20 C 3
trf6 D 4	9927 A 5	9941 C 4	trf21 C 3
trf7 D 4	9928 A 5	9942 C 4	
trf8 D 4			

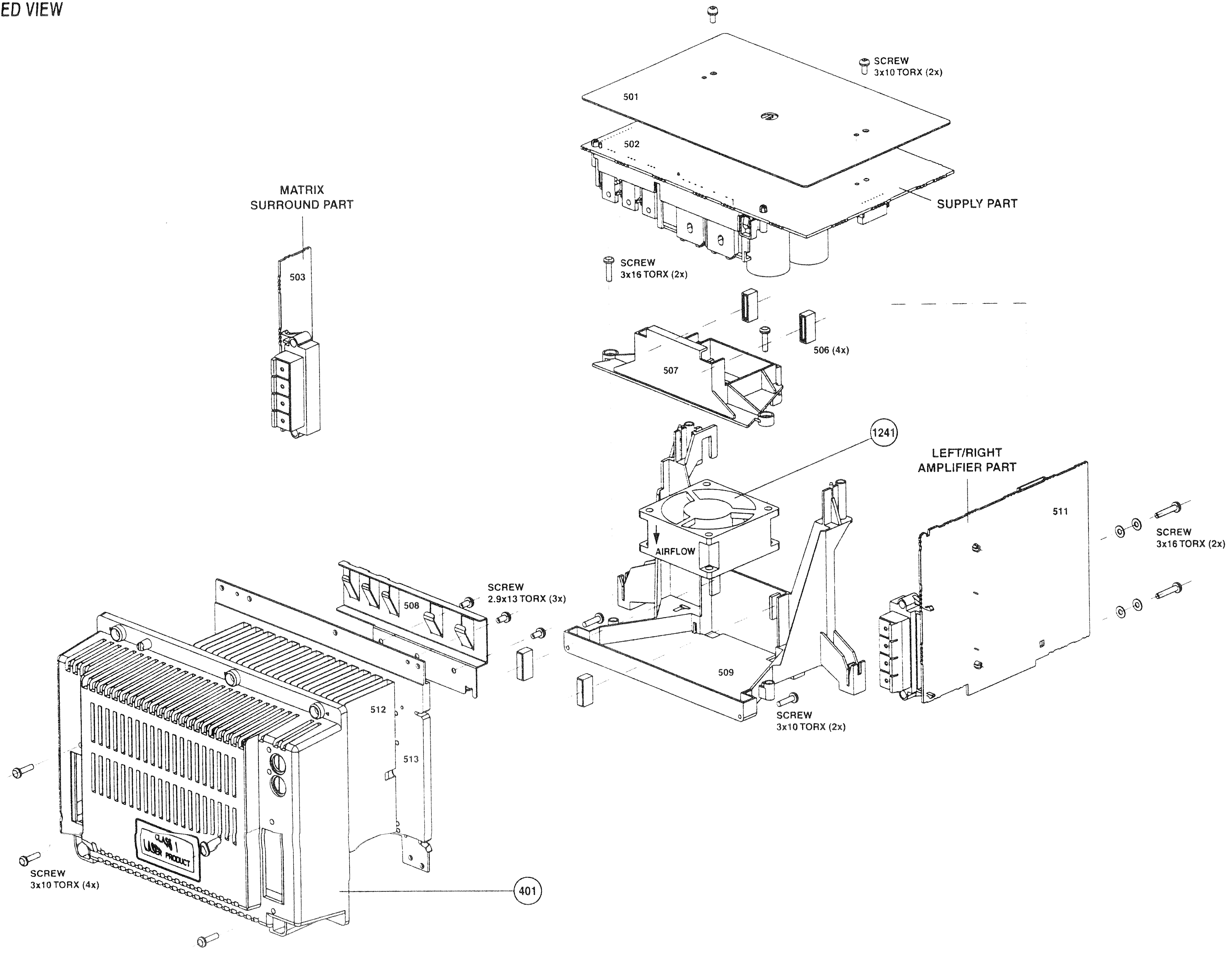
Mains Board

27 B 1	3901 B 1	6902 A 2	9901 D 3	9914 A 1
1901 E 3	3902 A 2	6903 A 3	9902 D 3	9915 D 2
1902 E 2	3903 A 2	6904 A 2	9903 C 3	9916 C 2
1905 C 3	3904 A 1	6905 A 2	9904 C 2	9917 C 1
1906 C 1	3905 A 1	6906 A 2	9905 C 1	9918 C 3
1907 E 1	3906 A 1	6908 B 1	9906 E 1	9919 C 3
1909 D 1	3907 E 3	6909 A 1	9907 A 3	
1910 C 1	5901 D 3	6910 A 1	9908 A 2	
2902 A 3	5902 D 3	6911 B 1	9909 A 2	
2903 A 2	5903 B 2	6912 B 1	9910 A 1	
2904 A 2	5905 B 1	7901 A 1	9911 A 1	
2905 A 1	6900 A 1	7902 A 1	9912 A 1	
2906 B 1	6901 A 3	9900 B 1	9913 A 1	


5
4
3
2
1
A
B
C
D
E
Interconnection Board
Transformer secondary
Mains Board
6901
6903
3901
5905
2906
5901
3907
Interconnection Board
Transformer primary
Transistor pinning
C
B
E

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

EXPLODED VIEW


SCREW
3x10 TORX (2x)
501
502
SUPPLY PART
MATRIX
SURROUND PART
503
SCREW
3x16 TORX (2x)
506 (4x)
507
1241
LEFT/RIGHT
AMPLIFIER PART
511
SCREW
3x16 TORX (2x)
AIRFLOW
SCREW
2.9x13 TORX (3x)
508
509
SCREW
3x10 TORX (2x)
512
513
CLASS 1
LASER PRODUCT
SCREW
3x10 TORX (4x)
401

MECHANICAL PARTS LIST

401	4822 256 10558	Rucksack - L/R
401	4822 256 10555	Rucksack - L/R and Matrix
1241	4822 361 11161	DC Bruchless Fan
	4822 256 10556	Holder STk47/P5-VA
	4822 466 93148	Spacer 5mm

ELECTRICAL PARTS LIST - MAINS BOARD

MISCELLANEOUS

1901	4822 265 31015	△	Mains Socket
1901#	4822 265 31016	△	Mains Socket
1902*	4822 272 10269	△	Voltage Selector
1905^	4822 071 55002	△	Fuse T5A 250V
1905#	4822 252 51123	△	Fuse T6,3A 250V
1906*	4822 071 55002	△	Fuse T5A 250V
1907*	4822 071 55002	△	Fuse T5A 250V
1909*	4822 267 10728	△	Primary Connector
1910	4822 265 20723	△	Primary Connector
1920	4822 071 55002	△	Fuse T5A 250V
1923	4822 071 55002	△	Fuse T5A 250V
1924	4822 071 52502	△	Fuse T2.5A 250V
1925	4822 071 51602	△	Fuse 1,6A 250V

CAPACITORS

2902	4822 121 43526	47nF 5% 250V
2903	4822 121 43526	47nF 5% 250V
2904*	4822 124 40255	100µF 20% 63V
2905*	4822 124 81029	100µF 20% 25V

RESISTORS

3901#	4822 053 21106	△	10M 5% 0,5W
3902	4822 050 11002		1k 1% 0,4W
3903	4822 050 11002		1k 1% 0,4W
3904*	4822 116 52283		4k7 5% 0,5W
3904^	4822 116 52244		15k 5% 0,5W
3905*	4822 116 52256		2k2 5% 0,5W
3906*	4822 116 83864		10k 5% 0,5W
3920*	4822 052 10108	△	1R 5% 0,33W

COILS & FILTERS

5901^	4822 157 11832	△	400µH 3A
5902*	4822 157 11628	△	Mains Choke
5903^	4822 146 11143	△	Standby Transformer
5903*	4822 146 11144	△	Standby Transformer
5903#	4822 146 11142	△	Standby Transformer
5905	4822 280 10382	△	Relay 1P 9V

DIODES

6900^	4822 130 31878	1N4003G
6901	4822 130 31878	1N4003G
6902	4822 130 31878	1N4003G
6903	4822 130 31878	1N4003G
6904	4822 130 31878	1N4003G
6905	4822 130 30621	1N4148
6906	4822 130 30621	1N4148
6908*	4822 130 34382	BZX79-B8V2
6909*	4822 130 32245	BYV10-40
6910*	4822 130 31878	1N4003G
6911	4822 130 30621	1N4148
6912	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7901*	4822 130 41246	BC327-25
7902*	4822 130 40959	BC547B

* For /21/21M only

^ Except for /21/21M

For /37 only

Note : Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS LIST - SUPPLY & LEFT/RIGHT AMPLIFIER BOARD

MISCELLANEOUS

1321	4822 267 31176	L/R Loudspeaker Socket
1327	4822 265 10912	Matrix Surround Socket

CAPACITORS

2254	4822 121 43526	47nF 5% 250V
2255	4822 121 43526	47nF 5% 250V
2256	4822 121 43526	47nF 5% 250V
2257	4822 124 80415	4700µF 20% 50V
2258	4822 124 80415	4700µF 20% 50V
2263	5322 121 42386	100nF 5% 63V
2264	5322 121 42386	100nF 5% 63V
2265	4822 124 80563	4700µF 20% 35V
2267	4822 124 40255	100µF 20% 63V
2268	4822 124 40769	4,7µF 20% 100V
2269	4822 122 33197	1nF 10% 50V
2270	4822 124 41579	10µF 20% 50V
2271	4822 124 40433	47µF 20% 25V
2279	5322 121 42386	100nF 5% 63V
2280	4822 124 12328	6800µF 16V
2282	4822 124 41579	10µF 20% 50V
2289	4822 124 40242	1µF 20% 63V
2290	4822 124 81029	100µF 20% 25V
2300	4822 121 51387	10nF 20% 16V
2301	4822 124 41584	100µF 20% 10V
2303	4822 121 41857	10nF 5% 250V
2323	4822 124 41576	2,2µF 20% 50V
2324	4822 124 41576	2,2µF 20% 50V
2325	4822 122 33532	3,3nF 5% 50V
2326	4822 122 33532	3,3nF 5% 50V
2327	5322 122 32334	220pF 10% 100V
2328	5322 122 32334	220pF 10% 100V
2329	5322 122 32311	470pF 10% 100V
2330	5322 122 32311	470pF 10% 100V
2331	5322 122 32261	4,7nF 10% 100V
2333	4822 124 81151	22µF 50V
2334	4822 124 81151	22µF 50V
2337	4822 122 10465	4,7pF 10% 50V
2338	4822 122 10465	4,7pF 10% 50V
2343	4822 124 41576	2.2µF 20% 50V
2344	4822 124 40764	22µF 100 V
2345	4822 124 40764	22µF 100 V
2348	4822 124 81043	10µF 20% 100V
2349	4822 124 81043	10µF 20% 100V
2350	5322 121 42386	100nF 5% 63V
2351	5322 121 42386	100nF 5% 63V
2352	4822 124 40181	220µF 20% 10V
2353	5322 121 42386	100nF 5% 63V
2354	5322 121 42386	100nF 5% 63V
2355	5322 122 32261	4,7nF 10% 100V
2356	5322 122 32261	4,7nF 10% 100V
2365	4822 126 12785	47nF 50V

RESISTORS

3251	4822 116 52256		2k2 5% 0.5W
3252	4822 116 52256		2k2 5% 0.5W
3254	4822 116 52228		680R 5% 0,5W
3255	4822 116 83883		470R 5% 0.5W
3259	4822 116 83864		10k 5% 0.5W
3260	4822 117 11342		0R33 5% 2W
3261	4822 116 83876		270R 5% 0.5W
3262	4822 116 52206		120R 5% 0.5W
3265	4822 116 52234		100k 5% 0.5W
3266	4822 116 52228		680R 5% 0,5W
3267	4822 116 52276		3k9 5% 0.5W
3268	4822 116 83864		10k 5% 0,5W
3270	4822 117 11342		0R33 5% 2W
3271	4822 050 11002		1k 1% 0.4W
3272	4822 116 52263		2k7 5% 0.5W
3273	4822 116 52244		15k 5% 0,5W
3274	4822 116 52271		33k 5% 0,5W
3275	4822 116 52271		33k 5% 0.5W
3278	4822 116 52256		2k2 5% 0,5W
3280	4822 116 52239		120k 5% 0,5W
3281	4822 116 83864		10k 5% 0,5W
3282	4822 052 10479	△	47R 5% 0,33W
3285	4822 116 52269		3k3 5% 0,5W
3286	4822 116 52269		3k3 5% 0,5W
3287	4822 116 52257		22k 5% 0,5W
3288	4822 052 10479	△	47R 5% 0,33W
3289	4822 052 10479	△	47R 5% 0,33W
3290	4822 117 12063		NTC DC 5W 10k 5%
3295	4822 116 83872		220R 5% 0,5W
3298	4822 116 52219		330R 5% 0,5W
3299	4822 116 52219		330R 5% 0,5W
3300	4822 052 10568	△	5R60 5% 0,33W
3302	4822 116 83884		47k 5% 0,5W
3304	4822 116 83884		47k 5% 0,5W
3305	4822 116 52257		22k 5% 0,5W
3306	4822 116 83882		39k 5% 0,5W
3309	4822 116 52271		33k 5% 0,5W
3312	4822 116 83864		10k 5% 0,5W
3313	4822 050 11002		1k 1% 0,4W
3315	4822 116 52291		56k 5% 0.5W
3316	4822 116 83884		47k 5% 0,5W
3317	4822 052 10109	△	10R 5% 0.33W
3321	4822 116 83864		10k 5% 0,5W
3322	4822 116 83864		10k 5% 0,5W
3323	4822 116 52234		100k 5% 0,5W
3324	4822 116 83864		10k 5% 0,5W
3325	4822 116 52207		1k2 5% 0,5W
3326	4822 116 52207		1k2 5% 0,5W
3327	4822 116 52291		56k 5% 0,5W
3328	4822 116 52291		56k 5% 0.5W
3329	4822 116 52226		560R 5% 0,5W

ELECTRICAL PARTS LIST - SUPPLY & LEFT/RIGHT AMPLIFIER BOARD

RESISTORS

3329	4822 116 52228		680R 5% 0,5W
3330	4822 116 52228		680R 5% 0,5W
3331	4822 116 52291		56k 5% 0,5W
3332	4822 116 52291		56k 5% 0,5W
3333	4822 052 10479	△	47R 5% 0,33W
3334	4822 052 10479	△	47R 5% 0,33W
3335	4822 116 52243		1k5 5% 0,5W
3336	4822 116 52243		1k5 5% 0,5W
3337	4822 050 11002		1k 1% 0,4W
3338	4822 050 11002		1k 1% 0,4W
3339	4822 113 80633	△	0R1 5% 3W
3340	4822 113 80633	△	0R1 5% 3W
3345	4822 116 52234		100k 5% 0,5W
3346	4822 116 83864		10k 5% 0,5W
3347	4822 116 52271		33k 5% 0,5W
3348	4822 116 83872		220R 5% 0,5W
3350	4822 050 11002		1k 1% 0,4W
3351	4822 116 52234		100k 5% 0,5W
3352	4822 116 52234		100k 5% 0,5W
3353	4822 116 52257		22k 5% 0,5W
3358	4822 050 11002	△	1k 1% 0,4W
3363	4822 053 10478	△	4R70 5% 1W
3364	4822 053 10478	△	4R70 5% 1W
3365	4822 116 52234		100k 5% 0,5W
3365	4822 116 52304		82k 5% 0,5W
3366	4822 116 52234		100k 5% 0,5W
3366	4822 116 52304		82k 5% 0,5W
3367	4822 116 83884		47k 5% 0,5W
3368	4822 116 83884		47k 5% 0,5W
3369	4822 116 83884		47k 5% 0,5W
3370	4822 116 83884		47k 5% 0,5W
3383	4822 116 83884		47k 5% 0,5W
3384	4822 116 83884		47k 5% 0,5W
3386	4822 116 83961		6k8 5%
3387	4822 116 83864		10k 5% 0,5W
3388	4822 116 83864		10k 5% 0,5W

COILS & FILTERS

5321	4822 157 70599		IND FXD BEAD EMI
5322	4822 157 70599		IND FXD BEAD EMI

DIODES

6252	5322 130 80686		1N5392
6255	4822 130 11139	△	GBU8D
6260	5322 130 80686		1N5392
6261	5322 130 80686		1N5392
6262	5322 130 80686		1N5392
6263	5322 130 80686		1N5392
6264	4822 130 61219		BZX79-B10
6270	4822 130 30621		1N4148
6271	4822 130 30621		1N4148
6281	4822 130 31878		1N4003G
6284	4822 130 34173		BZX79-B5V6
6289	4822 130 34281		BZX79-B15
6290	4822 130 34281		BZX79-B15
6292	4822 130 30621		1N4148
6293	4822 130 34382		BZX79-B8V2
6294	5322 130 80686		1N5392
6295	4822 130 30621		1N4148
6298	4822 130 34278		BZX79-B6V8
6299	4822 130 30621		1N4148
6301	4822 130 30621		1N4148
6302	5322 130 31504		BZX79-B3V3
6337	4822 130 30621		1N4148
6339	4822 130 30621		1N4148
6360	4822 130 34281		BZX79-B15

TRANSISTORS & INTEGRATED CIRCUITS

7251	4822 130 10812	BDX53BFI
7252	4822 130 40959	BC547B
7253	4822 130 40959	BC547B
7255	4822 130 40959	BC547B
7260	4822 130 40959	BC547B
7263	4822 130 40959	BC547B
7265	4822 130 41691	BC556B
7266	4822 130 44568	BC557B
7268	4822 130 40959	BC547B
7280	4822 130 40959	BC547B
7281	4822 209 31841	L7805CP
7282	4822 130 41246	BC327-25
7286	4822 130 41246	BC327-25
7290	4822 130 41246	BC327-25
7323	4822 130 44461	BC546B
7324	4822 130 44461	BC546B
7325	4822 130 40959	BC547B
7326	4822 130 40959	BC547B
7327	4822 130 44461	BC546B
7329	4822 209 17383	STk47-0901
7329	4822 209 17385	STK496-070
7350	4822 130 41691	BC556B

Note : Only the parts mentioned in this list are normal service spare parts.

AF7 BOARD

TABLE OF CONTENTS

Brief Introduction of the AF7 Board 12-1
Headphone Part - Circuit Diagram and layouts 12-1
AF7 Board - Component and Chip layouts 12-2
AF7 Board - Circuit Diagram (Part 1) 12-3
AF7 Board - Circuit Diagram (Part 2) 12-4
Dolby Prologic (DPL) Circuit Diagram 12-5
Electrical parts list 12-6

BRIEF INTRODUCTION OF THE AF7 BOARD

The AF7 Board consists of the following features :

a. TDA7437 AUDIO PROCESSOR IC
TDA7437 audio processor IC (7511) includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C bus.

b. MIC. MIXING
The AF7 Board can provide simple karaoke (without echo) which caters for mic. mixing with additional mic. amplifier board.

c. DOLBY PRO LOGIC (DPL)
Dolby Pro Logic (DPL) function is provided by IC M62460FP (7711). Delay circuit is also integrated into the same IC.

d. LINE OUT
Line out cinch socket is included for connection to external devices such as amplifier, recorders etc.

e. SUB-WOOFER OUT
Sub-woofer cinch socket is included for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND
Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER
A headphone can be driven by Op-amp NJM4556AM.

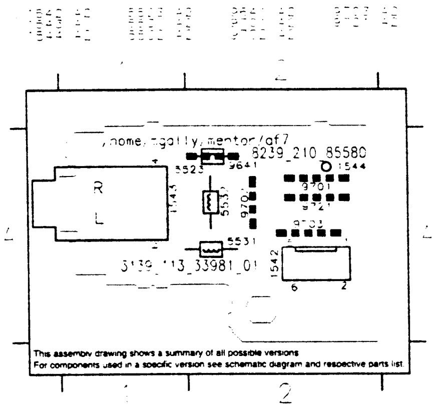
h. CD STANDBY CONTROL
Control circuit that switches on the supply to CD servo IC, HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING
Headphone sense circuit is for switching off DPL modes when headphone is plugged in.

j. ATTENUATION NETWORK
Attenuation network is provided at the output of the AF7 Board for interfacing with power modules.

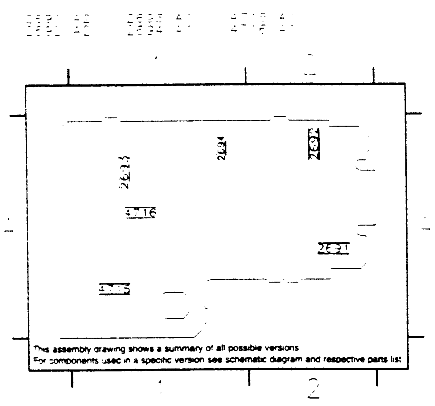
k. BASS AUTOMATIC LEVEL CONTROL (ALC)
This circuit will defeat the bass effect if it sense that there is excessive amount of bass frequencies present in the left and right audio channel. This will prevent excessive speaker excursions under high volume condition.

HEADPHONE BOARD - COMPONENT LAYOUT


/home/egolly/mentor/af7
8239 210 85580
5523
9641
1544
R
L
1543
5532
9701
9702
9703
5531
1542
3139 113 33981 01
6
2
1
2

This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram and respective parts list

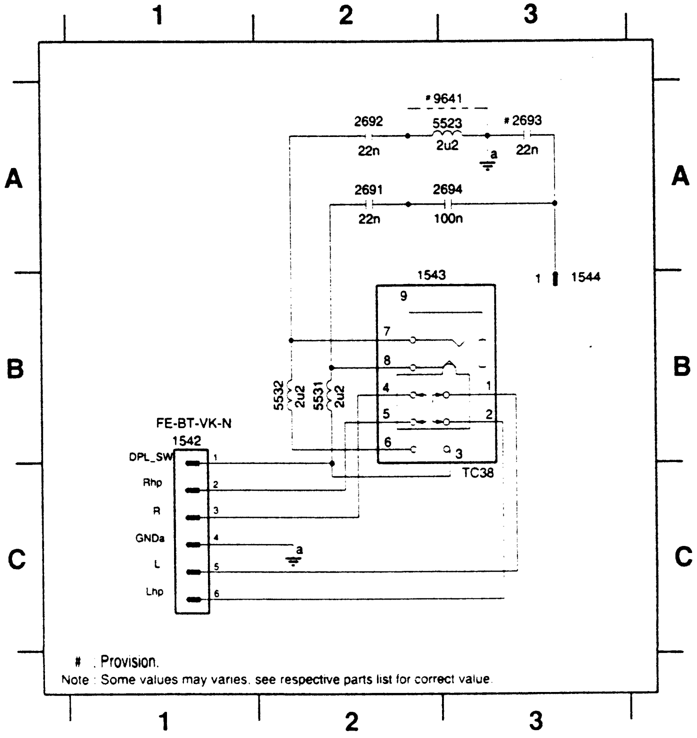
HEADPHONE BOARD - CHIP LAYOUT


2691
2694
2692
2693
1
2

This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram and respective parts list

HEADPHONE BOARD - CIRCUIT DIAGRAM

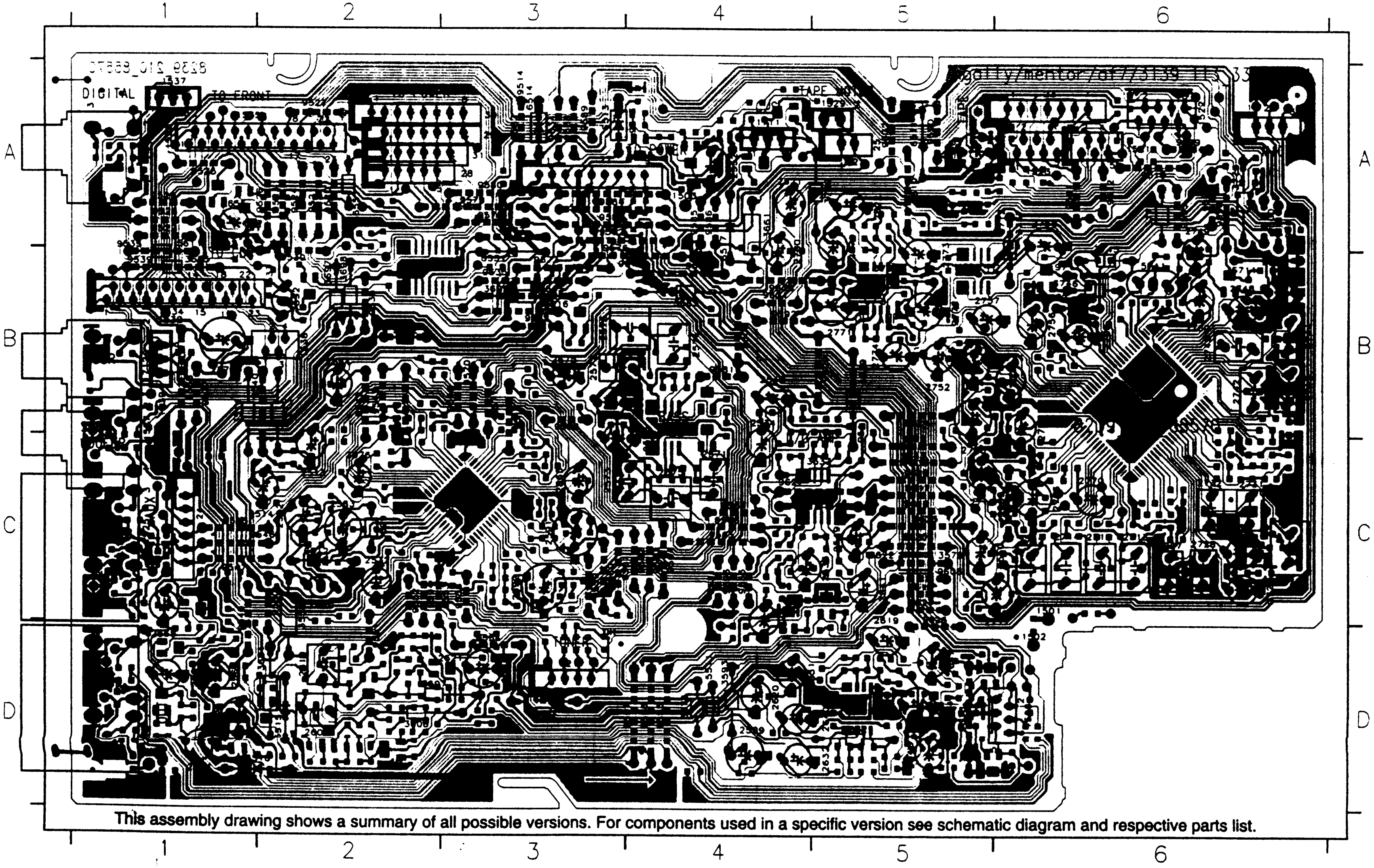
1542 B1	1544 B3	2692 A2	2694 A3	5531 B2	9641 A3
1543 B2	2691 A2	2693 A3	5523 A3	5532 B2	


1
2
3
A
B
C
#9641
2692
22n
5523
2u2
#2693
22n
a
2691
22n
2694
100n
1543
1
1544
9
7
8
4
5
6
1
2
3
TC38
5532
2u2
5531
2u2
FE-BT-VK-N
1542
DPL_SW
Rhp
R
GNDa
L
Lhp
a

: Provision.
Note : Some values may varies, see respective parts list for correct value

AF7 BOARD - COMPONENT LAYOUT

21	D3	1504	D1	1535	A1	2534	B4	2573	C3	2619	C5	2666	D1	2731	C6	2757	B5	2780	B4	3608	D2	3745	A6	6515	D2	9517	B3	9530	B2	9545	C1	9559	C3	9572	B3	9585	A4	9599	A6	9618	C5	9635	B3
23	A6	1521	A6	1536	A1	2540	B4	2574	B4	2620	D4	2675	B3	2732	C6	2758	A6	2790	B6	3632	D5	3746	B6	6516	D2	9518	B2	9531	C4	9546	C2	9560	C3	9573	B3	9586	A4	9600	A6	9620	C5	9636	B4
24	C1	1522	A6	1537	A1	2541	C5	2575	C4	2621	D3	2676	C2	2735	C6	2762	B6	2876	B1	3541	D3	3752	B5	6517	A4	9519	A6	9532	C6	9547	C1	9561	C3	9574	B4	9587	A3	9601	A6	9621	B5	9711	B6
25	A5	1523	A6	1538	B2	2542	C4	2576	B3	2631	D4	2711	C6	2742	B6	2765	C5	3513	B2	3655	A2	3772	A6	6531	B3	9520	A2	9533	C4	9549	C1	9562	C4	9575	B4	9588	A3	9602	A5	9622	C5	9712	A6
26	A6	1525	C1	1539	B1	2546	A5	2582	C2	2632	D5	2712	C6	2743	B6	2766	C6	3514	B1	3661	A4	3773	A6	6711	B6	9521	A2	9535	A1	9550	C2	9563	C4	9576	A3	9589	A3	9605	B4	9624	C5		
27	A3	1526	D1	1711	A4	2549	C5	2583	C2	2640	D5	2713	C6	2744	B6	2767	B6	3533	C5	3681	D2	5511	D4	7525	C2	9522	A1	9536	B2	9551	D2	9564	C4	9577	A3	9590	A5	9608	C5	9625	C5		
28	A3	1527	B1	1712	B1	2550	C6	2591	C3	2641	D5	2714	C6	2745	B6	2769	B5	3539	B5	3685	B4	5611	A1	7552	B2	9523	A2	9537	B1	9552	C2	9565	C4	9578	A3	9591	A6	9609	B5	9626	C5		
29	A3	1528	D6	2513	C2	2552	A4	2592	C3	2647	D5	2717	C6	2748	B6	2770	C6	3558	C2	3695	B1	5711	B6	9511	B5	9524	A2	9538	B1	9553	C3	9556	C4	9579	A3	9592	B4	9610	A5	9627	C4		
30	A3	1529	A5	2514	C2	2560	D1	2593	C4	2648	D5	2718	C5	2749	A6	2771	B5	3576	D4	3697	B2	5712	B6	9512	A6	9525	A1	9539	B1	9554	D3	9567	C4	9580	A3	9593	C4	9612	C5	9628	C5		
31	A3	1531	A1	2521	A4	2563	C3	2594	B4	2655	A1	2727	C6	2750	B6	2772	B5	3579	C5	3698	B2	6511	A5	9513	A4	9526	A2	9540	B1	9555	D4	9568	B3	9581	B4	9594	C2	9613	C5	9631	B4		
1501	C6	1532	B1	2522	A5	2564	B2	2599	D4	2661	D1	2728	C6	2751	B6	2773	B5	3593	D4	3699	B3	6512	C2	9514	A3	9527	A2	9542	B2	9556	D4	9569	B3	9582	A3	9595	A6	9615	C5	9632	B2		
1502	D6	1533	B2	2532	C2	2571	C4	2609	D2	2664	D1	2729	C6	2752	B5	2774	B5	3599	C2	3737	A6	6513	A3	9515	B3	9528	A1	9543	B2	9557	D4	9570	B3	9583	A3	9597	A6	9616	C5	9633	D5		
1503	A4	1534	B1	2533	C5	2572	B3	2610	D2	2665	D1	2730	C6	2756	B6	2779	A5	3607	D2	3739	A5	6514	A3	9516	B3	9529	A1	9544	C1	9558	C3	9571	B3	9584	A3	9598	A6	9617	C5	9534	A3		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

BRIEF INTRODUCTION OF THE AF7 BOARD

The AF7 Board consists of the following features :

a. TDA7437 AUDIO PROCESSOR IC
TDA7437 audio processor IC (7511) includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C bus.

b. MIC. MIXING
The AF7 Board can provide simple karaoke (without echo) which caters for mic. mixing with additional mic. amplifier board.

c. DOLBY PRO LOGIC (DPL)
Dolby Pro Logic (DPL) function is provided by IC M62460FP (7711). Delay circuit is also integrated into the same IC.

d. LINE OUT
Line out cinch socket is included for connection to external devices such as amplifier, recorders etc.

e. SUB-WOOFER OUT
Sub-woofer cinch socket is included for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND
Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER
A headphone can be driven by Op-amp NJM4556AM.

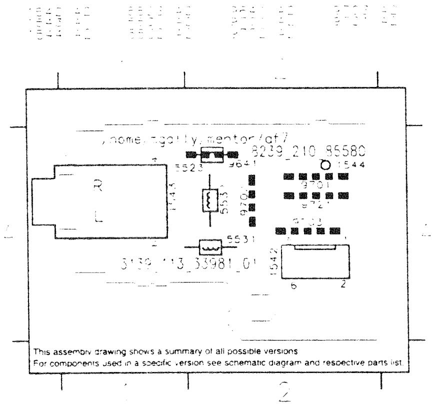
h. CD STANDBY CONTROL
Control circuit that switches on the supply to CD servo IC, HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING
Headphone sense circuit is for switching off DPL modes when headphone is plugged in.

j. ATTENUATION NETWORK
Attenuation network is provided at the output of the AF7 Board for interfacing with power modules.

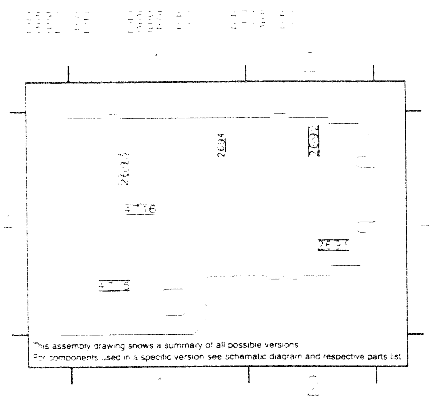
k. BASS AUTOMATIC LEVEL CONTROL (ALC)
This circuit will defeat the bass effect if it sense that there is excessive amount of bass frequencies present in the left and right audio channel. This will prevent excessive speaker excursions under high volume condition.

HEADPHONE BOARD - COMPONENT LAYOUT



This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram and respective parts list

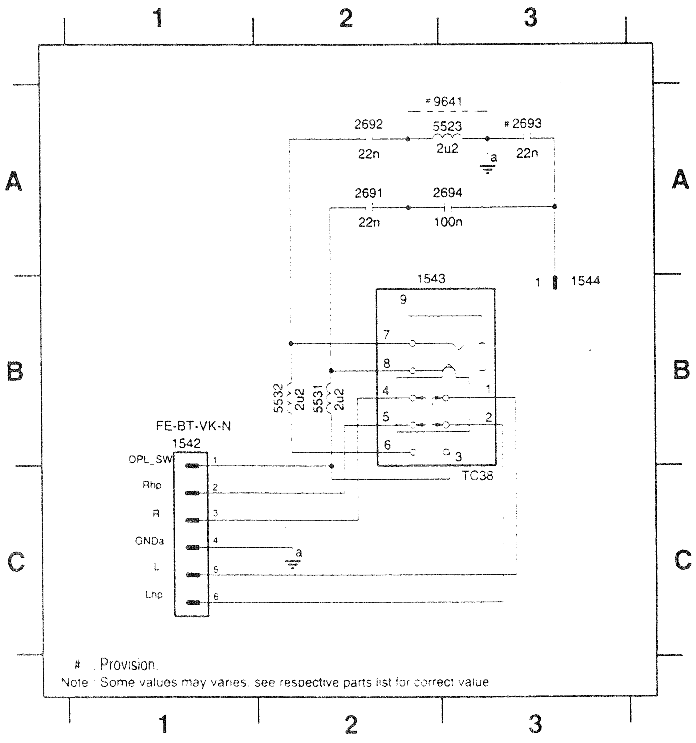
HEADPHONE BOARD - CHIP LAYOUT



This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram and respective parts list

HEADPHONE BOARD - CIRCUIT DIAGRAM

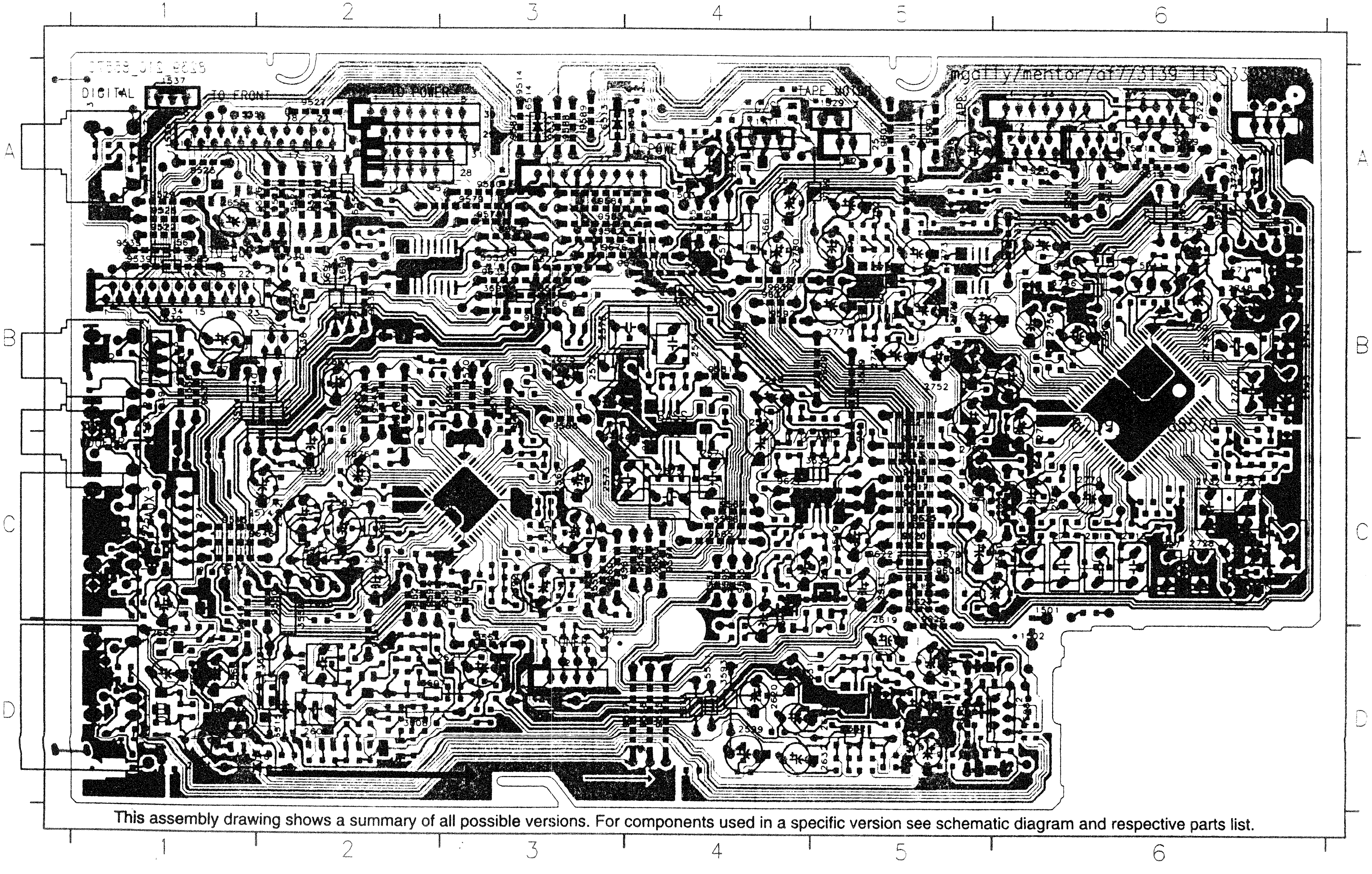
1542 B1	1544 B3	2692 A2	2694 A3	5531 B2	9641 A3
1543 B2	2691 A2	2693 A3	5523 A3	5532 B2	



: Provision.
Note : Some values may varies. see respective parts list for correct value

AF7 BOARD - COMPONENT LAYOUT

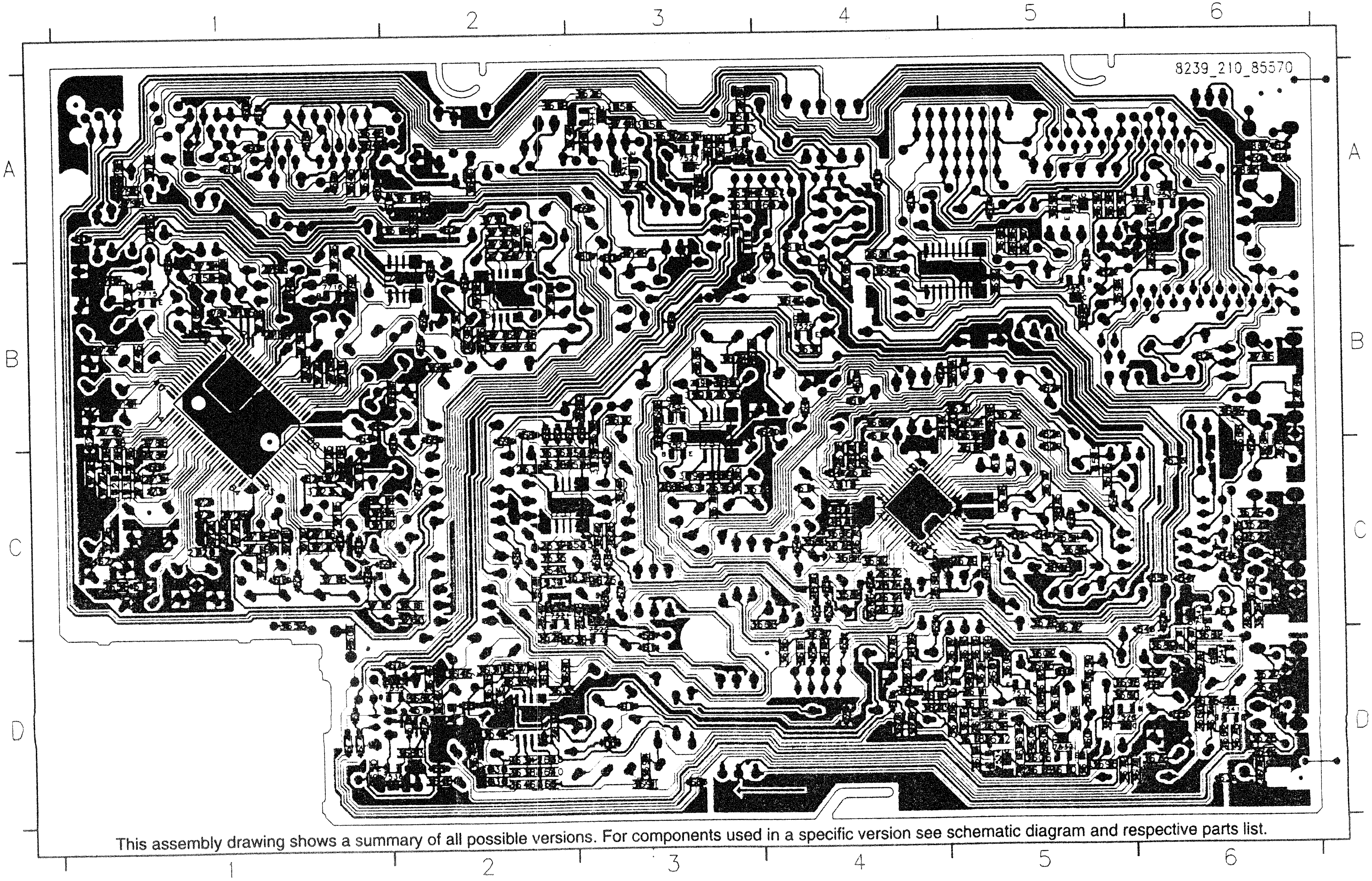
21 D3	1504 D1	1535 A1	2534 B4	2573 C3	2619 C5	2666 D1	2731 C6	2757 B5	2780 B4	3608 D2	3745 A6	6515 D2	9517 B3	9530 B2	9545 C1	9559 C3	9572 B3	9585 A4	9599 A6	9618 C5	9635 B3
23 A6	1521 A6	1536 A1	2540 B4	2574 B4	2620 D4	2675 B3	2732 C6	2758 A6	2790 B6	3632 D5	3746 B6	6516 D2	9518 B2	9531 C4	9546 C2	9560 C3	9573 B3	9586 A4	9600 A6	9620 C5	9636 B4
24 C1	1522 A6	1537 A1	2541 C5	2575 C4	2621 D3	2676 C2	2735 C6	2762 B6	2876 B1	3641 D3	3752 B5	6517 A4	9519 A6	9532 C6	9547 C1	9561 C3	9574 B4	9587 A3	9601 A6	9621 B5	9711 B6
25 A5	1523 A6	1538 B2	2542 C4	2576 B3	2631 D4	2711 C6	2742 B6	2765 C5	3513 B2	3655 A2	3772 A6	6531 B3	9520 A2	9533 C4	9549 C1	9562 C4	9575 B4	9588 A3	9602 A5	9622 C5	9712 A6
26 A6	1525 C1	1539 B1	2546 A5	2582 C2	2632 D5	2712 C6	2743 B6	2766 C6	3514 B1	3661 A4	3773 A6	6711 B6	9521 A2	9535 A1	9550 C2	9563 C4	9576 A3	9589 A3	9605 B4	9624 C5	
27 A3	1526 D1	1711 A4	2549 C5	2583 C2	2640 D5	2713 C6	2744 B6	2767 B6	3533 C5	3681 D2	5511 D4	7525 C2	9522 A1	9536 B2	9551 D2	9564 C4	9577 A3	9590 A5	9608 C5	9625 C5	
28 A3	1527 B1	1712 B1	2550 C6	2591 C3	2641 D5	2714 C6	2745 B6	2769 B5	3539 B5	3685 B4	5611 A1	7552 B2	9523 A2	9537 B1	9552 C2	9565 C4	9578 A3	9591 A6	9609 B5	9626 C5	
29 A3	1528 D6	2513 C2	2552 A4	2592 C3	2647 D5	2717 C6	2748 B6	2770 C6	3558 C2	3695 B1	5711 B6	9511 B5	9524 A2	9538 B1	9553 C3	9566 C4	9579 A3	9592 B4	9610 A5	9627 C4	
30 A3	1529 A5	2514 C2	2560 D1	2593 C4	2648 D5	2718 C5	2749 A6	2771 B5	3576 D4	3697 B2	5712 B6	9512 A6	9525 A1	9539 B1	9554 D3	9567 C4	9580 A3	9593 C4	9612 C5	9628 C5	
31 A3	1531 A1	2521 A4	2563 C3	2594 B4	2655 A1	2727 C6	2750 B6	2772 B5	3579 C5	3698 B2	6511 A5	9513 A4	9526 A2	9540 B1	9555 D4	9568 B3	9581 B4	9594 C2	9613 C5	9631 B4	
1501 C6	1532 B1	2522 A5	2564 B2	2599 D4	2661 D1	2728 C6	2751 B6	2773 B5	3593 D4	3699 B3	6512 C2	9514 A3	9527 A2	9542 B2	9556 D4	9569 B3	9582 A3	9595 A6	9615 C5	9632 B2	
1502 D6	1533 B2	2532 C2	2571 C4	2609 D2	2664 D1	2729 C6	2752 B5	2774 B5	3599 C2	3737 A6	6513 A3	9515 B3	9528 A1	9543 B2	9557 D4	9570 B3	9583 A3	9597 A6	9616 C5	9633 D5	
1503 A4	1534 B1	2533 C5	2572 B3	2610 D2	2665 D1	2730 C6	2756 B6	2779 A5	3607 C2	3739 A5	6514 A3	9516 B3	9529 A1	9544 C1	9558 C3	9571 B3	9584 A3	9598 A6	9617 C5	9634 A3	



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF7 BOARD - CHIP LAYOUT

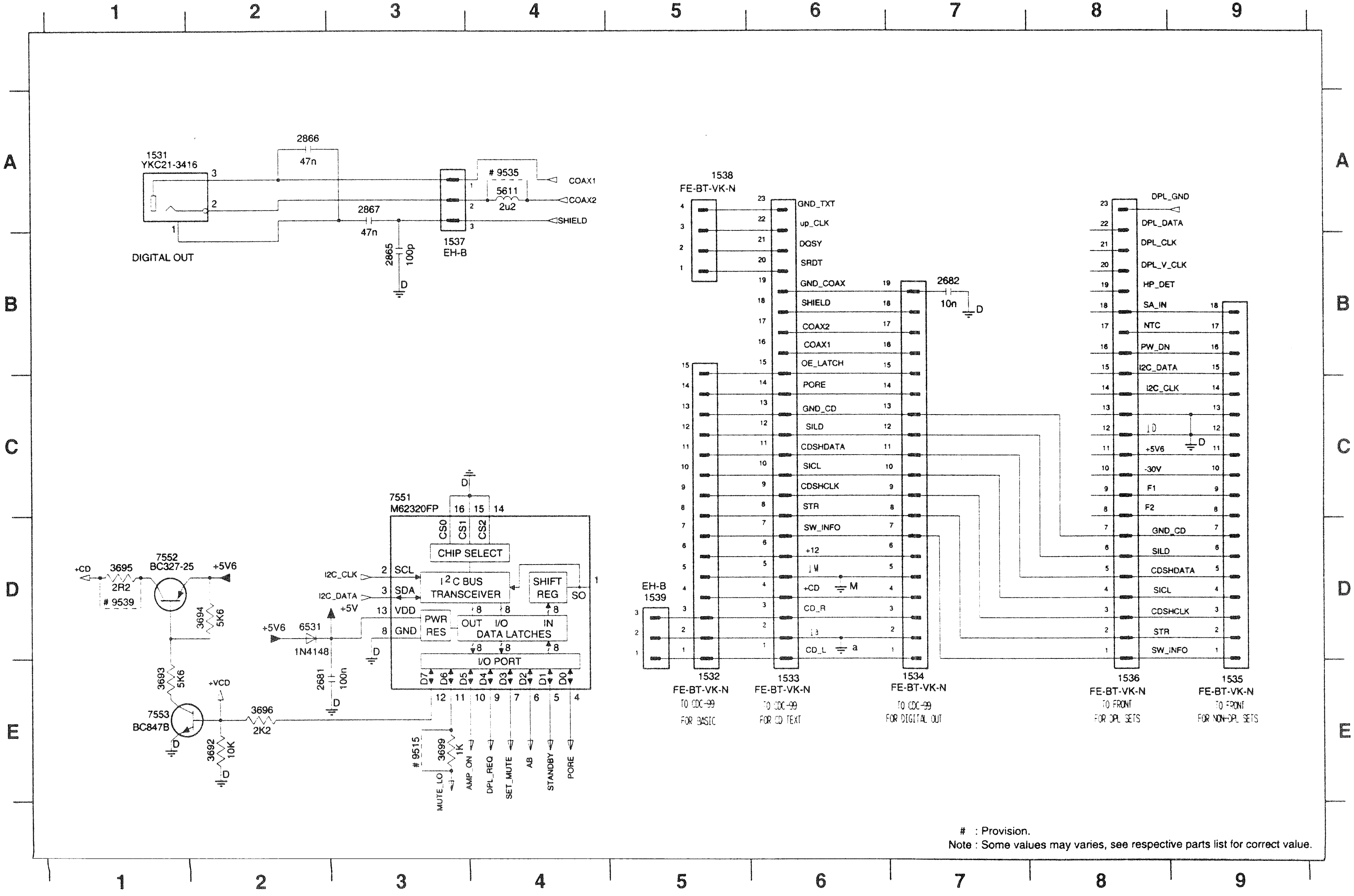
2501	D1
2511	B4
2512	C5
2515	C4
2516	C5
2517	C4
2519	C4
2520	B5
2523	C4
2524	B5
2525	C6
2526	C6
2527	C6
2528	C6
2529	C6
2531	C5
2535	C3
2536	C3
2537	C2
2538	C2
2539	C2
2543	D6
2544	D6
2545	D6
2547	C2
2548	C3
2551	A3
2553	A3
2577	C5
2578	C5
2579	C5
2580	C4
2581	C5
2595	C3
2596	B3
2597	C3
2598	B3
2601	D5
2602	D5
2603	D5
2604	D5
2605	D5
2606	D5
2607	D5
2608	D5
2611	D5
2612	D5
2613	D5
2614	D5
2615	D4
2616	D5
2617	D5
2618	D5
2623	C4
2624	B5
2625	C3
2626	C3
2633	D2
2634	D2
2635	D2
2636	D2
2637	D2
2638	D2
2639	D2
2649	D2
2650	D1
2651	A3
2652	A4
2656	A5
2657	A5
2658	C1
2662	D6
2663	D6
2668	C6
2669	C6
2670	C5
2671	C4
2672	C4
2673	C4
2674	C4
2677	B4
2678	D6
2681	B4
2682	B6
2715	C1
2716	C1
2719	C1
2720	C1
2721	C1
2722	C1
2723	C1
2724	C1
2725	C1
2726	C1
2733	C1
2734	C1
2737	C1
2738	B1
2739	C1
2740	B1
2741	B1
2746	B1
2747	B1
2753	B1
2754	B1
2755	B1
2759	B1
2760	B6
2761	B1
2763	B1
2768	C1
2775	A2
2776	B2
2777	A2
2778	B2
2781	A3
2782	B1
2783	A1
2784	B1
2785	B1
2786	C1
2787	C1
2788	C1
2789	B1
2792	B1
2793	A1
2794	A1
2795	A1
2796	B1
2797	A2
2798	B2
2865	A6
2866	A6
2867	A6
2868	C5
2869	C3
2870	C4
2871	C4
2872	C4
2873	C4
2874	C4
2875	C5
3511	D4
3512	D4
3515	C5
3516	C5
3517	A2
3518	A2
3519	A2
3520	A3
3521	B5
3522	B5
3523	C6
3524	C6
3525	C6
3526	C6
3527	D6
3528	D6
3529	D2
3530	D2
3531	C3
3532	B3
3534	C3
3535	C2
3536	C2
3537	C2
3538	C3
3540	B4
3541	C2
3542	C3
3543	C2
3544	C3
3545	A1
3546	A1
3547	A1
3548	A1
3549	A2
3550	B4
3551	A3
3552	A3
3553	A3
3554	A3
3555	A3
3556	A3
3557	A3
3559	D5
3560	D5
3561	B2
3562	B2
3563	C4
3564	B5
3565	C4
3566	C4
3569	B3
3570	B3
3571	C3
3572	B3
3573	C3
3574	B3
3575	D4
3577	C5
3578	C5
3580	C5
3581	C4
3582	C4
3583	C4
3584	C4
3585	C3
3586	B3
3587	B3
3588	B3
3589	C3
3590	B3
3591	C3
3592	B3
3594	D3
3595	D5
3596	D5
3597	D6
3598	D5
3601	D5
3602	D5
3603	D5
3604	D5
3605	D5
3606	D5
3609	D5
3610	D5
3611	D5
3612	D5
3613	D5
3614	D5
3615	D5
3616	D5
3617	D5
3618	D5
3619	D5
3620	D5
3621	D5
3622	D5
3623	D4
3624	D5
3625	D4
3626	D4
3627	D4
3628	D4
3629	D4
3631	D2
3633	D2
3634	D2
3635	D2
3636	D2
3637	D2
3638	D2
3639	D2
3640	D2
3642	D2
3643	D2
3645	D2
3646	D2
3647	D2
3648	D2
3649	A3
3650	B3
3651	A3
3652	A4
3653	C1
3656	A5
3657	A5
3658	A5
3659	A5
3660	A6
3662	D2
3663	D2
3665	B4
3666	A5
3667	B4
3668	B5
3671	D5
3672	D5
3673	D6
3674	D6
3675	D6
3676	D6
3677	D6
3678	D6
3679	D6
3680	D6
3682	D6
3683	B6
3684	C6
3686	D4
3687	D4
3688	A2
3689	A2
3690	D2
3691	D3
3692	B5
3693	B5
3694	B5
3696	B4
3711	C2
3712	C1
3713	C1
3714	C1
3715	C1
3716	C1
3717	C1
3718	C1
3719	C1
3720	C1
3721	C1
3722	C1
3723	C1
3724	C1
3725	C1
3726	C1
3727	C1
3728	C1
3729	C1
3732	B1
3733	B1
3734	B1
3735	B1
3736	C1
3738	B1
3740	A3
3741	A3
3742	A3
3743	A3
3744	A3
3748	B1
3751	B2
3753	B2
3754	B1
3755	A2
3756	B2
3757	A2
3758	B2
3759	A2
3760	B2
3761	A2
3762	B2
3763	C2
3764	C1
3765	B6
3774	A1
3775	A1
4511	C4
4512	B5
4513	D6
4514	C6
4515	C1
4516	D2
4517	B4
4518	C5
4519	C1
4520	C1
4521	A6
4522	B5
4523	C1
4524	A6
4525	C6
4526	C1
4527	B5
4528	B5
4529	C5
4530	B5
4531	A4
4532	A4
4533	C6
4534	B4
4535	C6
4536	C6
4537	C5
4538	B4
4539	D6
4540	B4
4541	B4
4542	C4
4543	C4
4544	C5
4545	C5
4546	C6
4547	C6
4548	D6
4549	B1
4550	C4
4551	D4
4552	D4
4553	C4
4554	B1
4555	C4
4556	C4
4557	D4
4558	C6
4559	D6
4560	C5
4561	D6
4562	C5
4563	D3
4564	D3
4565	C3
4566	C1
4567	D3
4568	D2
4569	D2
4570	D2
4571	D2
4572	D1
4573	D1
4574	D1
4575	D2
4576	C3
4577	C2
4578	B2
4579	A5
4580	B1
4581	C2
4582	C3
4583	C3
4584	A1
4585	C3
4586	B3
4587	B2
4588	B2
4589	B2
4590	A1
4591	B3
4592	C1
4593	C1
4594	B2
4595	A3
4596	B2
4597	B2
4598	B2
4599	B2
4600	B2
4601	A4
4602	A1
4603	A1
4604	A1
4605	C1
4606	A1
4607	B3
4609	B3
4610	A4
4611	A1
4612	A2
4613	D3
4614	D3
4615	D4
4616	A3
4617	B3
4618	A1
4619	A1
4620	C6
4621	B2
4622	C4
4623	C4
4624	B4
4625	B6
4627	C1
4628	B1
4629	A2
7511	C4
7512	C2
7513	C3
7515	D2
7521	C2
7522	C3
7523	C3
7524	B3
7526	A3
7527	A3
7528	D5
7529	B4
7531	D5
7532	D5
7533	D4
7534	D5
7535	D2
7536	D1
7537	A5
7538	A6
7539	A6
7541	D6
7542	D6
7543	C6
7551	B5
7553	B5
7711	B1
7712	B2
7713	A3
7714	A3
7715	B1
7716	B1
7717	B2



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

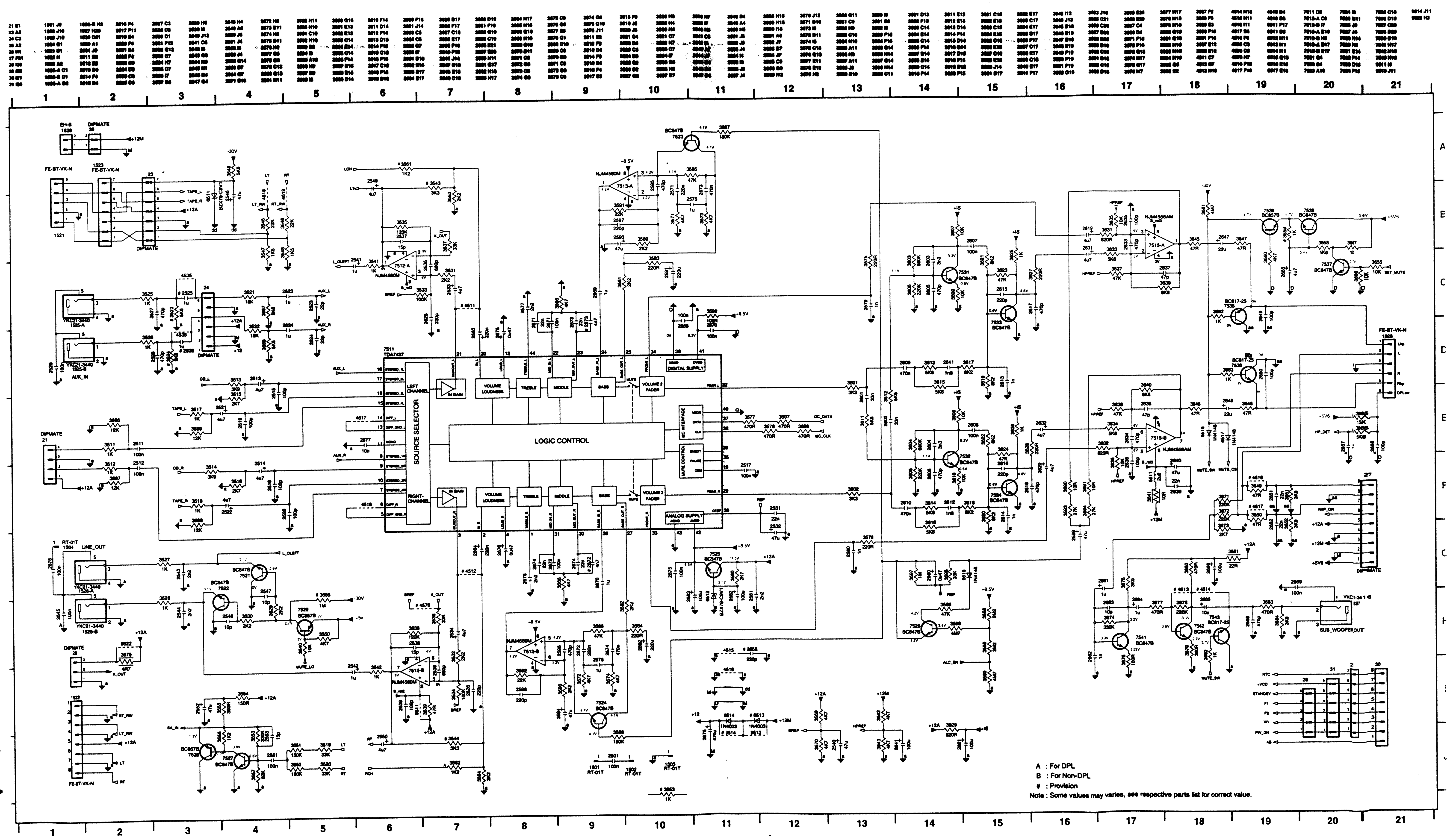
AF7 BOARD - CIRCUIT DIAGRAM (PART 2)

1531 A1	1533 E6	1535 E9	1537 B3	1539 D5	2682 B7	2866 A2	3692 E2	3694 D2	3696 E2	5611 A4	7551 C3	7553 E1	9535 A4
1532 E5	1534 E7	1536 E8	1538 A5	2681 E2	2865 B3	2867 A3	3693 E1	3695 D1	3699 E3	6531 D2	7552 D1	9515 E3	9539 D1


1 2 3 4 5 6 7 8 9
A B C D E
1531
YKC21-3416
DIGITAL OUT
2866
47n
2867
47n
2865
100p
D
1537
EH-B
# 9535
5611
2u2
COAX1
COAX2
SHIELD
1538
FE-BT-VK-N
GND_TXT
up_CLK
DQSY
SRDT
GND_COAX
SHIELD
COAX2
COAX1
OE_LATCH
PORE
GND_CD
SILD
CDSHDATA
SICL
CDSHCLK
STR
SW_INFO
+12
+CD
M
CD_R
CD_L
a
2682
10n
EH-B
1539
1532
FE-BT-VK-N
TO CDC-99
FOR BASIC
1533
FE-BT-VK-N
TO CDC-99
FOR CD TEXT
1534
FE-BT-VK-N
TO CDC-99
FOR DIGITAL OUT
DPL_GND
DPL_DATA
DPL_CLK
DPL_V_CLK
HP_DET
SA_IN
NTC
PW_DN
I2C_DATA
I2C_CLK
+5V6
-30V
F1
F2
GND_CD
SILD
CDSHDATA
SICL
CDSHCLK
STR
SW_INFO
1536
FE-BT-VK-N
TO FRONT
FOR DPL SETS
1535
FE-BT-VK-N
TO FRONT
FOR NON-DPL SETS
7551
M62320FP
CS0 CS1 CS2
CHIP SELECT
SCL
SDA
VDD
GND
I2C BUS
TRANSCEIVER
SHIFT
REG
SO
PWR
RES
OUT I/O IN
DATA LATCHES
I/O PORT
D7 D6 D5 D4 D3 D2 D1 D0
I2C_CLK
I2C_DATA
+5V
+5V6
6531
1N4148
2681
100n
# 9515
3699
1K
MUTE_LO
AMP_ON
DPL_REQ
SET_MUTE
AB
STANDBY
PORE
+CD
3695
2R2
# 9539
7552
BC327-25
+5V6
3694
5K6
3693
5K6
+VCD
7553
BC847B
3696
2K2
3692
10K

: Provision.
Note : Some values may varies, see respective parts list for correct value.

F7 BOARD - CIRCUIT DIAGRAM (PART 1)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
EH-B
1529
DIPMATE
25
+12M
FE-BT-VK-N
1523
23
TAPE_L
TAPE_R
+12A
1521
BZX79-C9V1
LT
RT
LT_RW
RT_RW
YKC21-3440
1525-A
YKC21-3440
1525-B
AUX_IN
AUX_L
AUX_R
DIPMATE
24
LCH
L_OLEFT
7512-A
NJM4560M
BREF
K_OUT
NJM4560M
7513-A
BC847B
7523
+8.5V
7511
TDA7437
AUX_L
CD_L
TAPE_L
CD_R
TAPE_R
AUX_R
DIPMATE
21
SOURCE SELECTOR
LEFT CHANNEL
RIGHT-CHANNEL
IN GAIN
VOLUME LOUDNESS
TREBLE
MIDDLE
BASS
VOLUME 2 FADER
LOGIC CONTROL
DIGITAL SUPPLY
ANALOG SUPPLY
I2C INTERFACE
MUTE CONTROL
I2C_DATA
I2C_CLK
RT-01T
1504
LINE_OUT
YKC21-3440
1526-A
1526-B
BC847B
7521
7522
7529
MUTE_LO
-30V
-5V
DIPMATE
26
1522
RT_RW
LT_RW
LT
RT
FE-BT-VK-N
SA_IN
BC857B
7528
BC847B
7527
7512-B
NJM4560M
RCH
7513-B
NJM4560M
BC847B
7524
BC847B
7526
BZX79-C9V1
1801
RT-01T
1802
RT-01T
1803
RT-01T
1N4003
+12M
+12
+12A
HPREF
+IS
7531
BC847B
7533
BC847B
7532
BC847B
7534
BC847B
7525
BC847B
ALC_EN
NJM4556AM
7515-A
7515-B
NJM4556AM
7536
BC857B
7538
BC847B
7537
BC847B
SET_MUTE
+5V6
BC817-25
7535
7539
FE-BT-VK-N
1528
HP_DET
MUTE_SW
MUTE_CS
27
AMP_ON
DIPMATE
YKC21-3416
1527
SUB_WOOFER OUT
7541
BC847B
7542
BC847B
7543
BC817-25
30
31
28
2
NTC
+VCD
STANDBY
F1
F2
30V
PW_DN
AB

A : For DPL

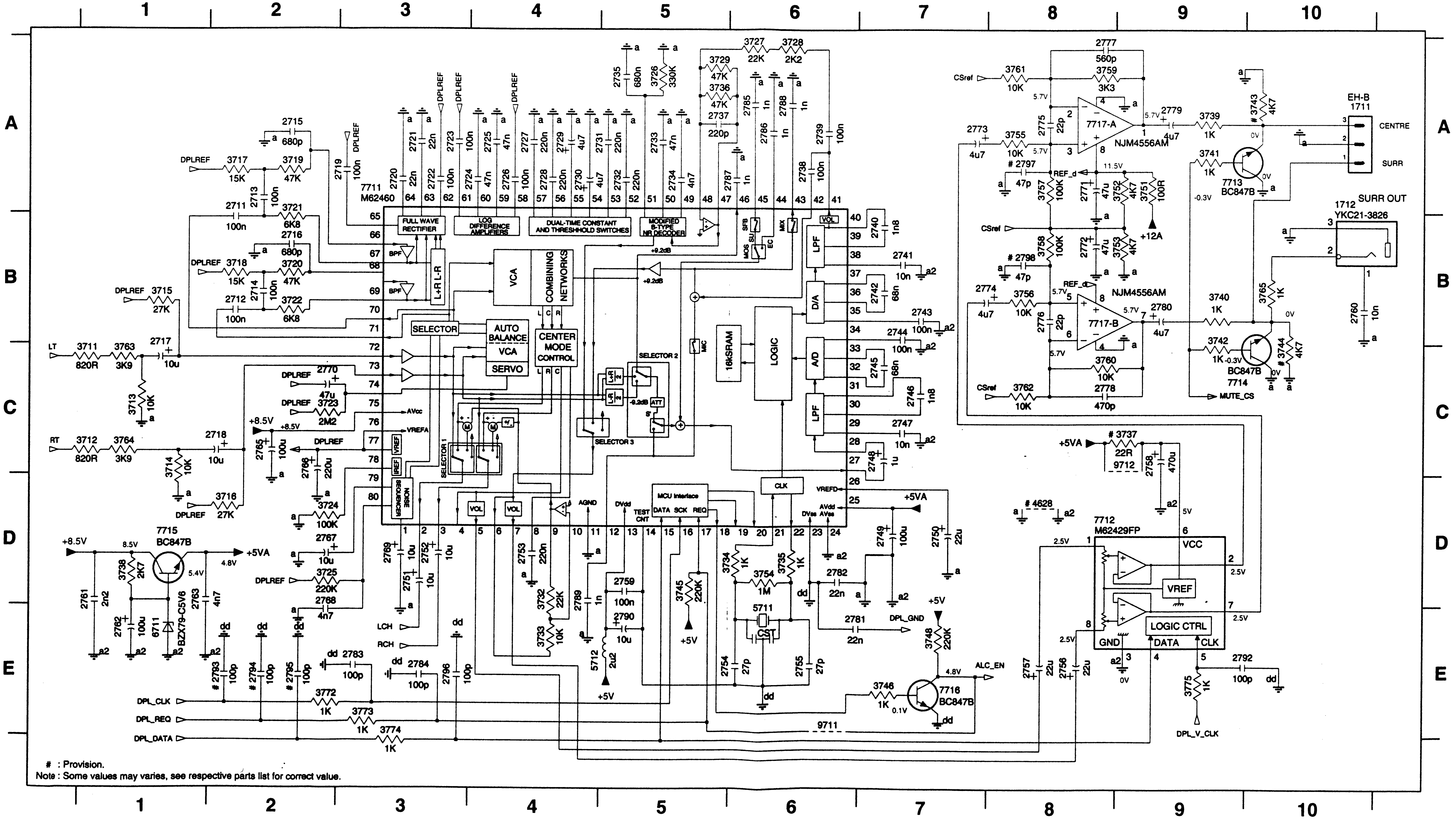
B : For Non-DPL

: Provision

Note : Some values may varies, see respective parts list for correct value.

DOLBY PROLOGIC (DPL) - CIRCUIT DIAGRAM

1711 A10	2717 C1	2725 A4	2733 A5	2742 B7	2750 D7	2758 C9	2767 D2	2775 A8	2783 E3	2792 E9	3712 C1	3720 B2	3728 A6	3738 D1	3746 E7	3757 A8	3765 B10	6711 E1	7717-B B8
1712 A10	2718 C2	2726 A4	2734 A5	2743 B7	2751 D3	2759 D5	2768 D2	2776 B8	2784 E3	2793 E2	3713 C1	3721 A2	3729 A5	3739 A9	3748 E7	3758 B8	3772 E2	7711 A3	9711 E6
2711 A2	2719 A3	2727 A4	2735 A5	2744 B7	2752 D3	2760 B10	2769 D3	2777 A8	2785 A6	2794 E2	3714 C1	3722 B2	3732 D4	3740 B9	3751 A9	3759 A8	3773 E3	7712 D8	9712 C9
2712 B2	2720 A3	2728 A4	2737 A5	2745 C7	2753 D4	2761 D1	2770 C2	2778 C8	2786 A6	2795 E2	3715 B1	3723 C2	3733 E4	3741 A9	3752 A9	3760 C8	3774 E3	7713 A9	
2713 A2	2721 A3	2729 A4	2738 A6	2746 C7	2754 E6	2762 E1	2771 A8	2779 A9	2787 A6	2796 E3	3716 D2	3724 D2	3734 D6	3742 B9	3753 B9	3761 A8	3775 E9	7714 C9	
2714 B2	2722 A3	2730 A4	2739 A6	2747 C7	2755 E6	2763 D1	2772 B8	2780 B9	2788 A6	2797 A8	3717 A2	3725 D2	3735 D6	3743 A10	3754 D6	3762 C8	4628 D8	7715 D1	
2715 A2	2723 A3	2731 A5	2740 B7	2748 C7	2756 E8	2765 C2	2773 A7	2781 E6	2789 D4	2798 B8	3718 B2	3726 A5	3736 A5	3744 C10	3755 A8	3763 C1	5711 E6	7716 E7	
2716 B2	2724 A4	2732 A5	2741 B7	2749 D7	2757 E8	2766 C2	2774 B7	2782 D6	2790 E5	3711 C1	3719 A2	3727 A6	3737 C9	3745 D5	3756 B8	3764 C1	5712 E4	7717-A A8	


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
7711
M62460
FULL WAVE RECTIFIER
LOG DIFFERENCE AMPLIFIERS
DUAL-TIME CONSTANT AND THRESHHOLD SWITCHES
MODIFIED B-TYPE NR DECODER
BPF
L+R L-R
VCA
COMBINING NETWORKS
SELECTOR
AUTO BALANCE
VCA
SERVO
CENTER MODE CONTROL
L C R
SELECTOR 1
SELECTOR 2
SELECTOR 3
NOISE SEQUENCER
VREF
IREF
VOL
16KSRAM
LOGIC
LPF
D/A
A/D
CLK
MCU interface
DATA SCK REQ
TEST CNT
AGND
DVdd
DVss AVss
AVdd
VREFD
AVcc
VREFA
+9.2dB
-9.2dB
ATT
MIC
SFB
MOS
SU
EC
MIX
LT
3711 820R
3763 3K9
2717 10u
3713 10K
RT
3712 820R
3764 3K9
2718 10u
3714 10K
DPLREF
3715 27K
3716 27K
3717 15K
3719 47K
2715 680p
2711 100n
2713 100n
3721 6K8
2716 680p
3718 15K
3720 47K
2714 100n
2712 100n
3722 6K8
2719 100n
2770 47u
3723 2M2
+8.5V
2765 100u
2766 220u
3724 100K
2767 10u
3725 220K
2768 4n7
7715
BC847B
+5VA
3738 2K7
2761 2n2
2762 100u
6711 BZX79-C5V6
2763 4n7
8.5V
5.4V
4.8V
a2
dd
2793 100p
2794 100p
2795 100p
2783 100p
2784 100p
2796 100p
DPL_CLK
DPL_REQ
DPL_DATA
3772 1K
3773 1K
3774 1K
LCH
RCH
2769 10u
2751 10u
2752 10u
2753 220n
3732 22K
3733 10K
2789 1n
2759 100n
2790 10u
5712 2u2
+5V
3745 220K
3734 1K
3754 1M
3735 1K
5711 CST
2754 27p
2755 27p
2782 22n
2749 100u
2750 22u
2781 22n
DPL_GND
3748 220K
7716 BC847B
3746 1K
0.1V
ALC_EN
9711
2720 22n
2721 22n
2722 100n
2723 100n
2724 47n
2725 47n
2726 100n
2727 220n
2728 220n
2729 220n
2730 4u7
2731 4u7
2732 220n
2733 220n
2734 4n7
2735 680n
3726 330K
3729 47K
3736 47K
2737 220p
3727 22K
3728 2K2
2785 1n
2786 1n
2787 1n
2788 1n
2738 100n
2739 100n
2740 1n8
2741 10n
2742 68n
2743 100n
2744 100n
2745 68n
2746 1n8
2747 10n
2748 1u
+5VA
CSref
3761 10K
2777 560p
3759 3K3
7717-A
NJM4556AM
2775 22p
2773 4u7
3755 10K
2797 47p
3757 100K
REF_d
2771 47u
3752 4K7
3751 100R
+12A
11.5V
5.7V
2779 4u7
3739 1K
3741 1K
7713 BC847B
-0.3V
3743 4K7
EH-B 1711
CENTRE
SURR
3758 100K
2798 47p
2772 47u
3753 4K7
2774 4u7
3756 10K
2776 22p
7717-B
3760 10K
2778 470p
3762 10K
2780 4u7
3740 1K
3742 1K
7714 BC847B
3744 4K7
3765 1K
MUTE_CS
1712 SURR OUT YKC21-3826
2760 10n
3737 22R
9712
2758 470u
4628
7712 M62429FP
VCC
VREF
LOGIC CTRL
GND
DATA
CLK
2.5V
0V
2757 22u
2756 22u
2792 100p
3775 1K
DPL_V_CLK

: Provision.
Note : Some values may varies, see respective parts list for correct value.

MISCELLANEOUS

1523	4822 267 10953	Flex Connector 7P
1525	4822 267 20452	Cinch Socket - Aux in
1526	4822 267 20452	Cinch Socket - Line-out
1527	4822 267 31729	Cinch Socket - Sub-Woofer out
1528	4822 267 10731	Flex Connector 6P
1531	4822 267 31729	Cinch Socket - Digital out
1534	4822 265 11553	Flex Connector 19P
1535	4822 265 11553	Flex Connector 19P
1542	4822 267 10731	Flex Connector 6P
1543	4822 265 11529	Headphone Socket

CAPACITORS

2501	4822 126 10002	100nF 20% 25V
2511	4822 126 10002	100nF 20% 25V
2512	4822 126 10002	100nF 20% 25V
2513	4822 124 40769	4,7µF 20% 100V
2514	4822 124 40769	4,7µF 20% 100V
2515	5322 122 32531	100pF 5% 50V
2516	5322 122 32531	100pF 5% 50V
2517	4822 126 13196	100nF 10% 25V
2519	5322 122 32531	100pF 5% 50V
2520	5322 122 32531	100pF 5% 50V
2521	4822 124 40769	4,7µF 20% 100V
2522	4822 124 40769	4,7µF 20% 100V
2523	5322 122 32658	22pF 5% 50V
2524	5322 122 32658	22pF 5% 50V
2527	5322 122 34099	470pF 10% 63V
2528	5322 122 34099	470pF 10% 63V
2529	4822 126 10002	100nF 20% 25V
2531	4822 122 33809	22nF 20% 50V
2532	4822 124 40433	47µF 20% 25V
2533	4822 124 40769	4,7µF 20% 100V
2534	4822 124 40769	4,7µF 20% 100V
2535	4822 122 32535	680pF 10% 63V
2536	4822 122 32535	680pF 10% 63V
2537	4822 126 13486	15pF 2% 63V
2538	4822 126 13486	15pF 2% 63V
2539	5322 122 32531	100pF 5% 50V
2540	4822 124 40433	47µF 20% 25V
2541	4822 124 40242	1µF 20% 63V
2542	4822 124 40242	1µF 20% 63V
2543	4822 122 33175	2,2nF 20% 50V
2544	4822 122 33175	2,2nF 20% 50V
2545	4822 126 10002	100nF 20% 25V
2546	4822 124 41751	47µF 20% 50V
2547	5322 122 32448	10pF 5% 63V
2548	5322 122 32448	10pF 5% 63V
2549	4822 124 40769	4,7µF 20% 100V
2550	4822 124 40769	4,7µF 20% 100V
2551	4822 126 13196	100nF 10% 25V
2552	4822 124 41751	47µF 20% 50V
2553	4822 126 13486	15pF 2% 63V
2560	5322 124 41948	470nF 20% 50V
2563	4822 124 40746	0,22µF 20% 63V
2564	4822 124 40746	0,22µF 20% 63V
2571	4822 121 42408	220nF 5% 63V
2572	4822 121 42408	220nF 5% 63V
2573	4822 121 51252	470nF 5% 63V
2574	4822 121 51252	470nF 5% 63V
2575	4822 121 51319	1µF 10% 63V
2576	4822 121 51319	1µF 10% 63V
2577	4822 122 33175	2,2nF 20% 50V
2578	4822 122 33175	2,2nF 20% 50V
2579	5322 122 34123	1nF 10% 50V
2580	5322 122 34123	1nF 10% 50V
2581	4822 122 33175	2,2nF 20% 50V
2582	4822 124 81029	100µF 20% 25V
2583	4822 124 81029	100µF 20% 25V
2591	4822 124 22263	220µF 20% 25V
2592	4822 124 22263	220µF 20% 25V
2593	4822 124 40433	47µF 20% 25V
2594	4822 124 40433	47µF 20% 25V
2595	5322 122 34099	470pF 10% 63V
2596	5322 122 34099	470pF 10% 63V
2597	4822 122 33575	220pF 5% 63V
2598	4822 122 33575	220pF 5% 63V
2599	4822 124 41751	47µF 20% 50V
2601	4822 126 12105	33nF 5% 50V
2602	4822 126 12105	33nF 5% 50V
2603	4822 122 33891	3,3nF 10% 63V
2604	4822 122 33891	3,3nF 10% 63V
2605	5322 122 34099	470pF 10% 63V
2606	5322 122 34099	470pF 10% 63V
2607	4822 126 13196	100nF 10% 25V
2608	4822 126 13196	100nF 10% 25V
2609	4822 121 51252	470nF 5% 63V
2610	4822 121 51252	470nF 5% 63V
2611	4822 126 10847	1,8nF 10% 63V
2612	4822 126 10847	1,8nF 10% 63V
2613	5322 122 34123	1nF 10% 50V
2614	5322 122 34123	1nF 10% 50V
2615	4822 122 33575	220pF 5% 63V
2616	4822 122 33575	220pF 5% 63V
2617	5322 122 34099	470pF 10% 63V
2618	5322 122 34099	470pF 10% 63V
2619	4822 124 40769	4,7µF 20% 100V
2620	4822 124 40769	4,7µF 20% 100V
2621	4822 124 81029	100µF 20% 25V
2623	4822 126 13836	1µF 16V
2624	4822 126 13836	1µF 16V
2625	4822 122 33575	220pF 5% 63V
2626	4822 122 33575	220pF 5% 63V
2631	4822 124 40769	4,7µF 20% 100V
2632	4822 124 40769	4,7µF 20% 100V
2633	5322 122 34099	470pF 10% 63V
2634	5322 122 34099	470pF 10% 63V
2635	5322 122 32531	100pF 5% 50V
2636	5322 122 32531	100pF 5% 50V
2637	4822 126 13692	47pF 1% 63V
2638	4822 126 13692	47pF 1% 63V
2639	4822 122 33809	22nF 20% 50V
2640	4822 124 40433	47µF 20% 25V
2641	4822 124 81029	100µF 20% 25V
2647	4822 124 81151	22µF 50V
2648	4822 124 81151	22µF 50V
2649	5322 122 32531	100pF 5% 50V
2650	5322 122 32531	100pF 5% 50V
2651	4822 122 33809	22nF 20% 50V
2652	4822 122 33809	22nF 20% 50V
2655	4822 124 40769	4,7µF 20% 100V
2661	4822 124 40242	1µF 20% 63V
2662	5322 122 34123	1nF 10% 50V
2663	5322 122 32448	10pF 5% 63V
2664	4822 124 40242	1µF 20% 63V
2665	4822 124 41579	10µF 20% 50V
2666	4822 124 81029	100µF 20% 25V
2668	5322 122 34099	470pF 10% 63V
2669	4822 126 10002	100nF 20% 25V
2670	4822 126 10002	100nF 20% 25V
2671	4822 126 10002	100nF 20% 25V
2672	4822 126 10002	100nF 20% 25V
2673	4822 122 33809	22nF 20% 50V
2674	4822 122 33809	22nF 20% 50V
2675	5322 124 41948	470nF 20% 50V
2676	5322 124 41948	470nF 20% 50V
2677	4822 122 33808	10nF 20% 50V
2678	4822 126 13196	100nF 10% 25V
2681	4822 126 13196	100nF 10% 25V
2682	4822 122 33808	10nF 20% 50V
2691	4822 122 33809	22nF 20% 50V
2692	4822 122 33809	22nF 20% 50V
2693	4822 122 33809	22nF 20% 50V
2694	4822 126 10002	100nF 20% 25V
2781	4822 122 33809	22nF 20% 50V
2784	5322 122 32531	100pF 5% 50V
2865	5322 122 32531	100pF 5% 50V
2866	4822 122 33797	47nF 20% 50V
2867	4822 122 33797	47nF 20% 50V
2868	4822 126 13196	100nF 10% 25V
2869	4822 126 13836	1µF 16V
2870	4822 126 13836	1µF 16V
2871	5322 122 32654	22nF 10% 63V
2872	5322 126 10223	4,7nF 10% 63V
2873	5322 126 10223	4,7nF 10% 63V
2874	5322 122 32654	22nF 10% 63V
2876	4822 124 80791	470µF 20% 16V

RESISTORS

3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 10102	1k 2% 0,25W
3513	4822 116 52276	3k9 5% 0,5W
3514	4822 116 52276	3k9 5% 0,5W
3515	4822 117 12955	2k7 1% 0,1W
3516	4822 117 12955	2k7 1% 0,1W
3517	4822 051 10102	1k 2% 0,25W
3518	4822 051 10102	1k 2% 0,25W
3519	4822 051 20333	33k 5% 0,1W
3520	4822 051 20333	33k 5% 0,1W
3521	4822 117 10965	18k 1% 0,1W
3522	4822 117 10965	18k 1% 0,1W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 10102	1k 2% 0,25W
3527	4822 051 10102	1k 2% 0,25W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 117 11449	2k2 1% 0,1W
3530	4822 117 11449	2k2 1% 0,1W
3531	4822 117 11449	2k2 1% 0,1W
3532	4822 117 11449	2k2 1% 0,1W
3533	4822 116 52234	100k 5% 0,5W
3534	4822 051 20104	100k 5% 0,1W
3535	4822 051 20124	120k 5% 0,1W
3536	4822 051 20124	120k 5% 0,1W
3537	4822 051 20333	33k 5% 0,1W
3538	4822 051 20333	33k 5% 0,1W
3539	4822 116 52195	47R 5% 0,5W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 10102	1k 2% 0,25W
3542	4822 051 10102	1k 2% 0,25W
3543	4822 051 20332	3k3 5% 0,1W
3544	4822 051 20332	3k3 5% 0,1W
3545	4822 051 20223	22k 5% 0,1W
3546	4822 051 20223	22k 5% 0,1W
3547	4822 117 11139	1k5 1% 0,1W
3548	4822 117 11139	1k5 1% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 117 10834	47k 1% 0,1W
3551	4822 051 20154	150k 5% 0,1W
3552	4822 051 20154	150k 5% 0,1W
3553	4822 051 20334	330k 5% 0,1W
3554	4822 117 10353	150R 1% 0,1W
3555	4822 051 20391	390R 5% 0,1W
3556	4822 051 20122	1k2 5% 0,1W
3557	4822 117 11149	82k 1% 0,1W
3558	4822 053 20225	2M2 5% 0,25W

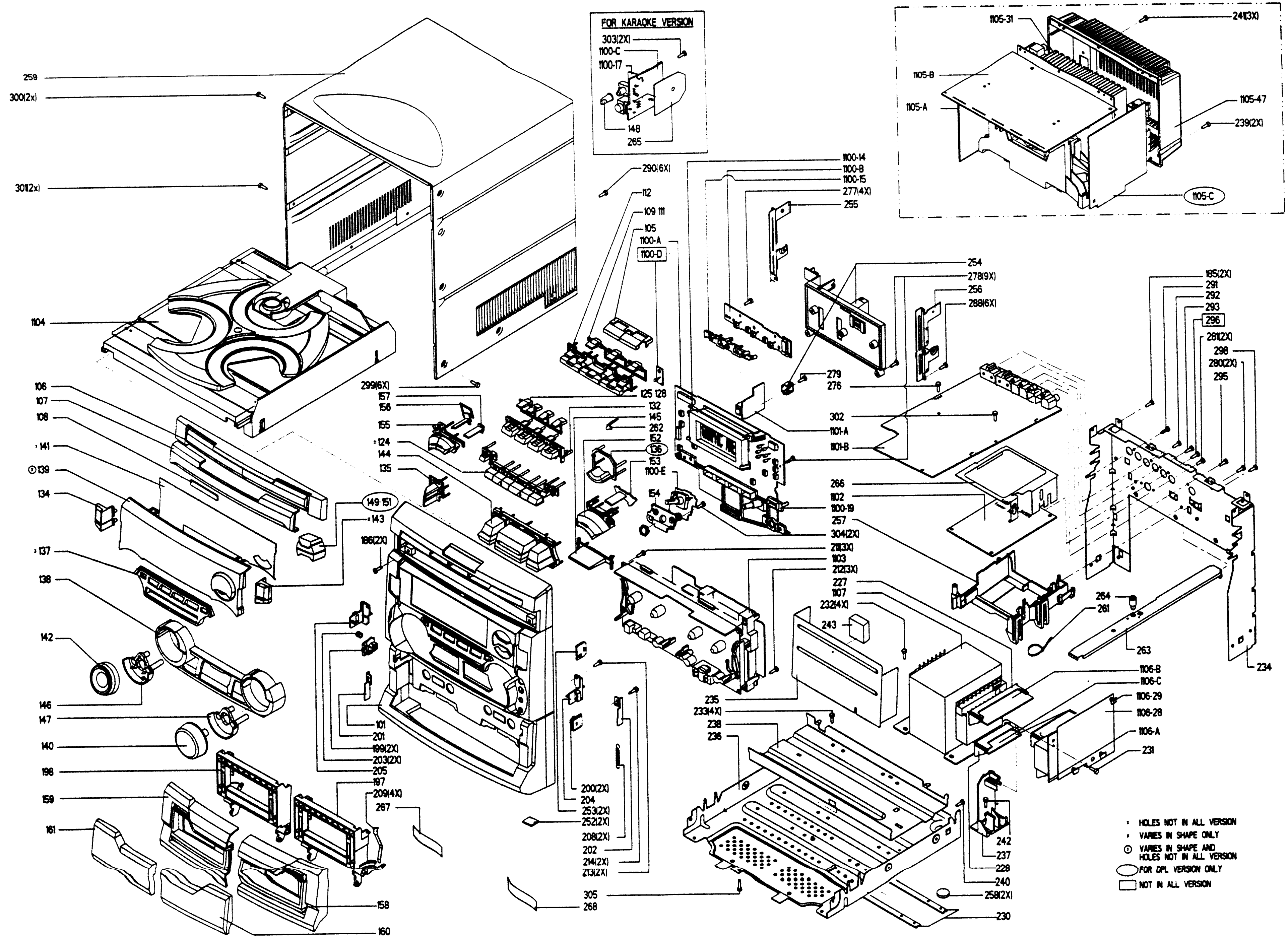
ELECTRICAL PARTS LIST - AF7 BOARD

RESISTORS

3559	4822 051 20225	2M2 5% 0,1W
3560	4822 051 20475	4M7 5% 0.1W
3563	4822 117 11449	2k2 1% 0,1W
3564	4822 117 11449	2k2 1% 0.1W
3565	4822 051 20472	4k7 5% 0,1W
3566	4822 051 20472	4k7 5% 0.1W
3569	4822 051 20472	4k7 5% 0.1W
3570	4822 051 20472	4k7 5% 0,1W
3571	4822 051 20472	4k7 5% 0,1W
3572	4822 051 20472	4k7 5% 0.1W
3573	4822 051 20472	4k7 5% 0.1W
3574	4822 051 20472	4k7 5% 0,1W
3575	4822 117 11503	220R 1% 0,1W
3576	4822 116 83872	220R 5% 0,5W
3577	4822 051 20471	470R 5% 0,1W
3578	4822 051 20471	470R 5% 0,1W
3579	4822 052 10478	4R7 5% 0,33W
3580	4822 117 12955	2k7 1% 0,1W
3581	4822 117 11449	2k2 1% 0,1W
3582	4822 117 11449	2k2 1% 0,1W
3583	4822 117 11503	220R 1% 0,1W
3584	4822 117 11503	220R 1% 0,1W
3585	4822 117 10834	47k 1% 0,1W
3586	4822 117 10834	47k 1% 0,1W
3587	4822 051 20154	150k 5% 0,1W
3588	4822 051 20154	150k 5% 0,1W
3589	4822 117 11449	2k2 1% 0,1W
3590	4822 117 11449	2k2 1% 0,1W
3591	4822 051 20223	22k 5% 0,1W
3592	4822 051 20223	22k 5% 0,1W
3593	4822 116 52264	27k 5% 0,5W
3594	4822 051 20273	27k 5% 0,1W
3595	4822 051 20333	33k 5% 0,1W
3596	4822 117 10834	47k 1% 0,1W
3597	4822 051 20105	1M 5% 0,1W
3598	4822 051 20475	4M7 5% 0,1W
3599	4822 116 52175	100R 5% 0,5W
3601	4822 051 20332	3k3 5% 0,1W
3602	4822 051 20332	3k3 5% 0,1W
3603	4822 051 20684	680k 5% 0,1W
3604	4822 051 20684	680k 5% 0,1W
3605	4822 117 13579	220k 1% 0,1W
3606	4822 117 13579	220k 1% 0,1W
3607	4822 116 83864	10k 5% 0,5W
3608	4822 116 83864	10k 5% 0,5W
3609	4822 117 10833	10k 1% 0,1W
3610	4822 117 10833	10k 1% 0,1W
3611	4822 051 20562	5k6 5% 0,1W
3612	4822 051 20562	5k6 5% 0,1W
3613	4822 051 20562	5k6 5% 0,1W
3614	4822 051 20562	5k6 5% 0,1W
3615	4822 051 20562	5k6 5% 0,1W
3616	4822 051 20562	5k6 5% 0,1W
3617	4822 051 20822	8k2 5% 0,1W
3618	4822 051 20822	8k2 5% 0,1W
3619	4822 051 20822	8k2 5% 0,1W
3620	4822 051 20822	8k2 5% 0,1W
3621	4822 051 20822	8k2 5% 0,1W
3622	4822 051 20822	8k2 5% 0,1W
3623	4822 117 10834	47k 1% 0,1W
3624	4822 117 10834	47k 1% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3627	4822 117 11503	220R 1% 0,1W
3628	4822 117 11503	220R 1% 0,1W
3629	4822 117 11454	820R 1% 0,1W
3631	4822 117 11454	820R 1% 0,1W
3632	4822 116 52231	820R 5% 0,5W
3633	4822 051 20562	5k6 5% 0,1W
3634	4822 051 20562	5k6 5% 0,1W
3635	4822 117 10833	10k 1% 0,1W
3636	4822 117 10833	10k 1% 0,1W
3637	4822 117 10834	47k 1% 0,1W
3638	4822 117 10834	47k 1% 0,1W
3639	4822 117 10833	10k 1% 0,1W
3640	4822 117 10833	10k 1% 0,1W
3641	4822 052 10109	10R 5% 0,33W
3642	4822 051 20472	4k7 5% 0,1W
3643	4822 051 20472	4k7 5% 0,1W
3645	4822 051 20479	47R 5% 0,1W
3646	4822 051 20479	47R 5% 0,1W
3647	4822 051 20479	47R 5% 0,1W
3648	4822 051 20479	47R 5% 0,1W
3649	4822 051 20479	47R 5% 0,1W
3650	4822 051 20479	47R 5% 0,1W
3651	4822 051 20392	3k9 5% 0,1W
3652	4822 051 20392	3k9 5% 0,1W
3655	4822 116 83864	10k 5% 0,5W
3656	4822 117 10833	10k 1% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 051 20562	5k6 5% 0,1W
3660	4822 051 20472	4k7 5% 0,1W
3661	4822 053 20475	4M7 5% 0,25W
3662	4822 051 10102	1k 2% 0,25W
3663	4822 051 10102	1k 2% 0,25W
3667	4822 051 20562	5k6 5% 0,1W
3668	4822 051 20562	5k6 5% 0,1W
3671	4822 117 13579	220k 1% 0,1W
3672	4822 117 13579	220k 1% 0,1W
3673	4822 117 12955	2k7 1% 0,1W
3674	4822 051 20334	330k 5% 0,1W
3675	4822 051 20392	3k9 5% 0,1W

ELECTRICAL PARTS LIST - AF7 BOARD

3676	4822 051 20101	100R 5% 0,1W
3677	4822 051 20471	470R 5% 0,1W
3678	4822 117 13579	220k 1% 0,1W
3679	4822 051 20391	390R 5% 0,1W
3680	4822 051 20471	470R 5% 0,1W
3681	4822 052 10229	22R 5% 0,33W
3682	4822 051 10102	1k 2% 0,25W
3683	4822 051 20471	470R 5% 0,1W
3684	4822 051 20392	3k9 5% 0,1W
3686	4822 117 11383	12k 1% 0,1W
3687	4822 117 11383	12k 1% 0,1W
3688	4822 117 11383	12k 1% 0,1W
3689	4822 117 11383	12k 1% 0,1W
3690	4822 051 20109	10R 5% 0,1W
3691	4822 051 20109	10R 5% 0,1W
3692	4822 117 10833	10k 1% 0,1W
3693	4822 051 20562	5k6 5% 0,1W
3693	4822 117 11449	2k2 1% 0,1W
3694	4822 051 20562	5k6 5% 0,1W
3695	4822 116 81154	2R2 5% 0,5W
3696	4822 117 11449	2k2 1% 0,1W
3697	4822 116 83883	470R 5% 0,5W
3698	4822 116 83883	470R 5% 0,5W
3699	4822 050 11002	1k 1% 0,4W
3773	4822 051 10102	1k 2% 0,25W
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4552	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4560	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4564	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4567	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4569	4822 051 20008	0R Jumper 0805
4570	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4572	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4575	4822 051 20008	0R Jumper 0805
4576	4822 051 20008	0R Jumper 0805
4577	4822 051 20008	0R Jumper 0805
4579	4822 051 20008	0R Jumper 0805
4580	4822 051 20008	0R Jumper 0805
4581	4822 051 20008	0R Jumper 0805
4582	4822 051 20008	0R Jumper 0805
4583	4822 051 20008	0R Jumper 0805
4584	4822 051 20008	0R Jumper 0805
4585	4822 051 20008	0R Jumper 0805
4586	4822 051 20008	0R Jumper 0805
4587	4822 051 20008	0R Jumper 0805
4588	4822 051 20008	0R Jumper 0805
4589	4822 051 20008	0R Jumper 0805
4590	4822 051 20008	0R Jumper 0805
4591	4822 051 20008	0R Jumper 0805
4592	4822 051 20008	0R Jumper 0805
4593	4822 051 20008	0R Jumper 0805
4595	4822 051 20008	0R Jumper 0805
4599	4822 051 20008	0R Jumper 0805
4600	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805


FOR KARAOKE VERSION
303(2X)
1100-C
1100-17
148
265
259
300(2x)
301(2x)
1104
106
107
108
141
139
134
137
138
142
146
147
140
198
159
161
158
160
290(6X)
112
109 111
105
1100-A
1100-D
299(6X)
157
156
155
124
144
135
149-151
143
186(2X)
125 128
132
145
262
152
136
153
1100-E
154
101
201
199(2X)
203(2X)
205
197
209(4X)
267
200(2X)
204
253(2X)
252(2X)
208(2X)
202
214(2X)
213(2X)
305
268
1100-14
1100-B
1100-15
277(4X)
255
254
278(9X)
256
288(6X)
279
276
302
1101-A
1101-B
266
1102
1100-19
257
304(2X)
211(3X)
1103
212(3X)
227
1107
232(4X)
243
235
233(4X)
238
236
1105-31
241(3X)
1105-B
1105-A
1105-47
239(2X)
1105-C
185(2X)
291
292
293
296
281(2X)
298
280(2X)
295
264
261
263
234
1106-B
1106-C
1106-29
1106-28
1106-A
231
242
237
228
240
258(2X)
230
HOLES NOT IN ALL VERSION
VARIES IN SHAPE ONLY
VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
FOR DPL VERSION ONLY
NOT IN ALL VERSION

ELECTRICAL PARTS LIST - AF7 BOARD

RESISTORS

4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4609	4822 051 20008	0R Jumper 0805
4611	4822 051 20008	0R Jumper 0805
4612	4822 051 20008	0R Jumper 0805
4613	4822 051 20008	0R Jumper 0805
4614	4822 051 20008	0R Jumper 0805
4615	4822 051 20008	0R Jumper 0805
4618	4822 051 20008	0R Jumper 0805
4619	4822 051 20008	0R Jumper 0805
4620	4822 051 20008	0R Jumper 0805
4621	4822 051 20008	0R Jumper 0805
4622	4822 051 20008	0R Jumper 0805
4623	4822 051 20008	0R Jumper 0805
4624	4822 051 20008	0R Jumper 0805
4625	4822 051 20008	0R Jumper 0805
4627	4822 051 20008	0R Jumper 0805
4629	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5511	4822 157 62552	Coil 2,2µH 5%
5523	4822 157 62552	Coil 2,2µH 5%
5531	4822 157 62552	Coil 2,2µH 5%
5532	4822 157 62552	Coil 2,2µH 5%
5611	4822 157 62552	Coil 2,2µH 5%

DIODES

6511	4822 130 30862	BZX79-C9V1
6512	4822 130 30862	BZX79-C9V1
6514	4822 130 31878	1N4003G
6515	4822 130 30621	1N4148
6516	4822 130 30621	1N4148
6517	4822 130 30621	1N4148
6531	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7511	4822 209 17386	TDA7437T
7512	4822 209 83357	NJM4560M
7513	4822 209 83357	NJM4560M
7515	4822 209 31378	NJM4556AM
7521	4822 130 60511	BC847B
7522	4822 130 60511	BC847B
7523	4822 130 60511	BC847B
7524	4822 130 60511	BC847B
7525	4822 130 40959	BC547B
7526	5322 130 60508	BC857B
7527	4822 130 60511	BC847B
7528	4822 130 60511	BC847B
7529	5322 130 60508	BC857B
7531	4822 130 60511	BC847B
7532	4822 130 60511	BC847B
7533	4822 130 60511	BC847B
7534	4822 130 60511	BC847B
7535	4822 130 42804	BC817-25
7536	4822 130 42804	BC817-25
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7539	5322 130 60508	BC857B
7541	4822 130 60511	BC847B
7542	4822 130 60511	BC847B
7543	4822 130 42804	BC817-25
7551	4822 209 17345	M62320FP
7552	4822 130 41246	BC327-25
7553	4822 130 60511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

101	4822 459 05298		Cabinet Front
105	4822 410 12461		Button CDC Open/Close
106	4822 442 01845		Cover Tray CDC
107	4822 442 01846		Cover Tray Orn
108	4822 454 13035		Badge Philips
112	4822 410 12297		Button Set CDC Select
124	4822 410 12542		Button Set Ctrl
132	4822 410 12543		Button Set S-Sel
134	4822 410 12465		Button Set Stdby/Timer
135	4822 410 12466		Button Set Dubbing/Rec
137	4822 442 01924		Cover Orn Ctrl
138	4822 442 01925		Cover Orn SNP
139	4822 450 10701		Window Display
140	4822 410 12544		Knob Volume Rotary
142	4822 410 12468		Jog Rotary
143	4822 442 01923		Cover RDS/NEWS
144	4822 410 12546		Button Set SNP
148	4822 410 12472		Knob Karaoke
152	4822 410 12547		Button Set Max Sound
155	4822 410 12548		Button Set Enter/More
158	4822 443 11282		Cover Cassette Right
159	4822 443 11279		Cover Cassette Left
160	4822 442 01918		Lens Cassette Right
161	4822 442 01919		Lens Cassette Left
197	4822 443 10488		Door Cassette Right
198	4822 443 10487		Door Cassette Left
199	4822 402 10621		Push-Catch
200	4822 529 10322		Damper Assembly
203	4822 492 11344		Spring Compression
204	4822 402 11246		Bracket Right
205	4822 402 11245		Bracket Left
208	4822 492 11345		Spring Tension
209	4822 492 42787		Spring Cassette
252	4822 462 40683		Foot Rubber
254	4822 466 12197		Plate Front
258	4822 462 40683		Foot Rubber
259	4822 426 10807		Cabinet Rear
349	4822 445 10857		Surround Speaker /37
350	4822 445 10869		LS Pair To Left /21
350	4822 445 10871		LS Pair To Right /21
350	4822 445 10863		LS Pair To Left /37
350	4822 445 10864		LS Pair To Right /37
351	4822 303 50063		FM Aerial /21
351	4822 320 11094		FM Aerial /37
356	4822 219 10683		Remote Control
384	4822 303 50082		AM Frame Aerial
385	4822 321 10249	△	Mains Cord /21
385	4822 321 11466	△	Mains Cord /37
387	4822 736 17113		Instruction For Use /21
387	4822 736 17112		Instruction For Use /37
1107	4822 146 11146	△	Mains Transformer /21
1107	4822 146 11194	△	Mains Transformer /37
1200	4822 320 12657		Flex Cable BD 19P 560mm
1201	4822 320 12661		Flex Cable BD 19P 400mm
1202	4822 320 12653		Flex Cable BD 6P 150mm
1204	4822 320 12713		Flex Cable AD 6P 340mm Folded
1205	4822 320 12752		Flex Cable AD 7P 180mm
1206	4822 320 12654		Flex Cable AD 7P 220mm

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

4822 240 10397	Woofer 6,5" 6R 100W
4822 240 10398	Tweeter 2,5"
4822 248 10011	Plug Wiring W/Piezo Assembly
4822 325 50229	Grommet
4822 458 10692	Cloth Frame Assembly Left
4822 458 10693	Cloth Frame Assembly Right

SURROUND BOX BREAKDOWN

4822 240 10388	Speaker 4" 12R 20W /37

Note : Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

185	D3 x 10
186	D3 x 10
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
231	D3 x 10
232	M3 x 10
233	M3 x 6
239	M3 x 10
240	D3 x 12
241	M3 x 10
242	M3 x 10
276	D3 x 12
277	D3 x 12
278	D3 x 12
279	M3 x 12
280	D3 x 12
281	D3 x 12
288	D3 x 10
290	M3 x 10
291	D3 x 12
292	D3 x 12
293	D3 x 12
295	D3 x 12
298	M3 x 10
299	M3 x 10
300	M3 x 10
301	M3 x 10
302	M3 x 16
303	D3 x 12
304	D3 x 12
305	M3 x 6